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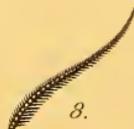
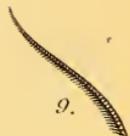
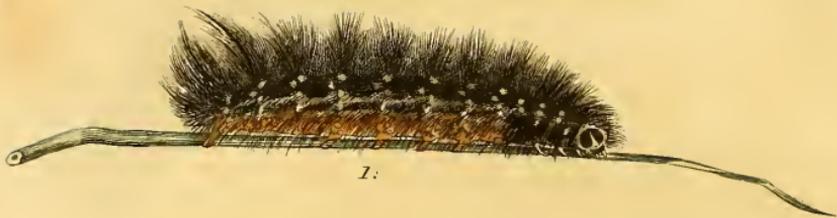
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[No. IV.]

EDITORIAL REMARKS, BY JOHN LOWELL, ONE OF THE EDITORS.

*The History of the Massachusetts Agricultural Society—
The recent attacks upon its management—General views
on this subject.*

ONE of the editors, is induced to avow his agency in these remarks, because he would not commit his colleagues, and because he entertains no sentiments on this, or any other subject, which he feels the smallest desire to conceal. The Massachusetts Agricultural Society has been charged with inefficiency, it has been accused of arrogating to itself merits which belong exclusively to the Society in Berkshire, it has been attacked from another quarter for adopting bad regulations as to its premiums at the annual Cattle Show, and by both classes of fault finders, it has been stigmatized as a set of "*Gentlemen Farmers*" publishing unfair accounts of experiments, or making manure, and breeding cattle in their libraries—all these sarcasms fall pointless—they do not excite a feeling of irritation but of regret, that in a cause, in which of all others, one might hope strife could never enter, a generous noble cause, of advancing the best interests of our common country, such feelings should be indulged and avowed. The Massachusetts Agricultural Society, its members and its trustees, have never claimed any exclusive or peculiar merit. They have endeavoured to pro-

mote the interests of agriculture which they believed *one* of the most and indeed *the most* important branch of human industry. Its annual products compared with all others, are at least as fifty to one. It was in a wretched state in 1792 when this society was incorporated, perhaps *never* lower. On recurring to the list of original members it will be found to embrace persons in all parts of Massachusetts and Maine, at least seven eighths of whom were chosen from *agricultural* counties. It will be found also to embrace a large number of the most venerable and honourable names then in Massachusetts. I need only mention John Adams, James Bowdoin, Samuel Adams, Fisher Ames, George Cabot, John Brooks, Francis Dana, Rev. Dr. Dean, the author of the *New-England Farmer*, Lieut. Governor Cushing, Dr. Cutler the Botanist, Dr. Dexter, Hon. Samuel Dexter, his son Samuel Dexter, jr. Justin Ely, Dwight Foster, Hon. Elbridge Gerry late Governor, and Hon. Nathaniel Gorham former President of Congress, Christopher Gore, William Heath, John Hancock, the very popular patriot and Governor, General Lincoln, Levi Lincoln, late Lieut Governor, Hon. George Leonard, Theodore Lyman, Jonathan Mason, Samuel Phillips formerly President of the Senate, and Lieut. Governor, Hon. Timothy Pickering, Hon. Thomas Russell, first President of the Society, and greatest benefactor, Hon. James Sullivan, late Governor of the State, David Sears, Hon. Increase Sumner, late Governor of this State, Judge Sedgwick, Judge Sewall, General Shepherd, Thompson I. Skinner, Judge Simeon Strong, Hon. Cotton Tufts, Israel Thorndike, Henry Van Schaack of Pittsfield, Hon. Joseph B. Varnum, Hon. James Warren, of Plymouth, and a much greater number. Need I say, that the founders of this extensive Society entertained liberal views, that it embraced without distinction of parties, a large, I might almost say an infinitely great proportion of all that Massachusetts then possessed of talent, intelligence, influence and virtue? Has this Society in any *one instance* departed

from its original purity and principle? Has it suffered that worst of all scourges, *party spirit*, to enter, *even for a moment*, its threshold? We defy any man, (for it has no enemies, and therefore we shall not confine the challenge to them,) we defy any man to point out a case in which it has permitted this deplorable feeling to enter into its measures. Singly devoted to the interests of agriculture, it has viewed with delight the confidence of all parties in its integrity and impartiality. We need not say that its published communications have been as frequently from one party as from another. The only remaining question is whether they have fairly fulfilled the public expectations. In the first place it may be remarked, that they made a most liberal subscription to a common fund, which now amounts to thirteen hundred dollars a year. It will be found that this whole fund was principally raised by donations from *opulent men*. Mr. Russell being the largest contributor, Mr. Gore the second, and Mr. Bowdoin the third. The fund has been increased to its present amount by the care, intelligence and zeal of the Treasurers of the Society, by the disinterested conduct of the trustees who have never expended one cent for their own advantage or entertainment, but have husbanded the funds as if they were their own. Now we confidently appeal to our liberal friends, and associates in the common cause in the distant counties, whether the opulent part of the Society should be reproached for their efforts which treasured up a fund to be employed whenever the state of intelligence in the country, and the progress of society should demand it? If it be asked whether the society did much in its infancy, we answer readily and frankly, no. But with still more confidence we add that it was not their fault. The institution was ahead of the age and of the intelligence of the state, and of public spirit. Its two first volumes will shew that the trustees were not remiss. Their queries distributed all over the state prove their zeal, their intelligence, their intimate knowledge of

the real wants of agriculture. No society in Europe or America ever issued a more valuable set of queries, and no society could at this day improve them except by some trifling additions derived from new discoveries. But neither Europe nor America were prepared at that time for the improvements and experiments which have since taken place. It is praise enough that, the Massachusetts Agricultural Society was the third in order of time, framed, established, and endowed to promote the cause of Agriculture, (as we believe) in any part of the world and that it never lost sight of its object, and was always ready to encourage, and reward all attempts to improve any one branch of agriculture and to give publicity to any ingenious suggestions for the promotion of this art. Is there any solid reason for encouraging a distinction between *practical* and *theoretical* farmers? Or if it pleases our witty friends, *gentlemen* farmers? The last expression, however, in such a country as ours, is invidious; it tends to excite prejudices. It looks, as if the theoretical farmers claimed to be *above* the practical ones. It leads to distrust, and to the propagation of prejudices against the truth. We shall consider this question more fully. A southern planter, like WASHINGTON, or Jefferson, or Madison, or Taylor of Caroline, the famous author of *Arator*, has no other dependence, we will suppose, and it is generally the case, but his land and his labourers. He never touches the plough personally, but upon its products, his fortune depends. He is educated as a farmer, he has no other employment, unless when called into public service. Can it be pretended, that as he directs all the operations of his own farm, changes them according to his experience, and his constantly increasing information from books and practice, that he is not as good a judge of practical farming, as a New-England farmer who conducts his own plough? Have these southern planters who never personally labour, shewn any defect of skill? Have they not varied their cultivation, introduced not only new modes of culture, but new plants

which have doubled the productions of the United States? In my early days, rice and indigo were almost the exclusive productions of South Carolina. We have seen the culture of cotton substituted, and exports to the amount of forty millions of dollars take the place of articles which did not yield perhaps ten millions. Would merely practical labouring farmers have been so likely to make these speculative changes? We think not. Let us proceed to New England. What natural obstacles should prevent President Adams, or Col. Pickering, or Mr. Gore, or Mr. Lyman, or Mr. Quincy, or Mr. Brooks, or Mr. Parsons, or the late Lieut. Governor Lincoln, or his son, from comprehending the principles of agriculture, or carefully and accurately weighing the facts which resulted from their experiments? I will grant, that as they may not *personally* labour, and may not as carefully superintend their labourers, they may not make as great profits as those who do, but they are as capable of keeping exact accounts of the comparative profits of one crop or another, to say the least. They can test as well as the best *practical* farmer the advantages of one mode of cultivation when compared with another. They can perceive the effects of different manures and of different crops. They can tell whether their cattle are or are not most economically supplied by pasturage or soiling. They can decide whether by cultivating corn only, or carrots, potatoes, Swedish turnips, and mangel wurtzel, they can have a greater surplus of hay, and support more stock. All these points, the theoretical farmer can decide as well as the others unless it be assumed that they are incapable of computing the lowest sums in arithmetic. But we do not mean to rest this question on this ground only. We assert, and mean to prove, that almost all the improvements of the agricultural art were the effects of the skill and industry of theoretical farmers, and that even the most familiar implements of husbandry now in so common use that our farmers believe that they always existed in their pre-

sent state have been improved by the effects of theoretical men. The plough of the Antient Romans was a machine as different from ours as possible and would excite the ridicule of the most ignorant farmer. Even the French farmers at this day have a most unwieldy plough, and their oxen draw this rude implement by their horns only. They have not yet learned the value of our rake. Their hoes are most clumsy and inconvenient. Within three years a light hoe with four steeled prongs has been introduced with us for digging potatoes, which is decidedly superior to the common one. Ploughs have undergone great changes and improvements chiefly by the inventions of theoretical men. The addition of the regulating wheel to the breaking up plough is found to be of great value. The progress of all these discoveries is slow, and nothing contributes to retard it, so much, as these occasional sneers at Theoretical Farmers. Gentlemen Farmers (if this term so unkind suits our friends better) are the Pioneers in agriculture in the same manner as mechanics in their workshops have been the pioneers in manufactures, and it would be as absurd to laugh at the barber, who introduced the Spinning Jenny in Great Britain which gave the first impulse to cotton manufactures, or at the American artist who invented the cotton gin, or at Fulton who first applied successfully the steam engine to navigation, on the ground, that the two first were not practical manufacturers and the last not a practical navigator, as to contend, that President Jefferson's hill side plough was of no value, because he never turned over a furrow in his life.

Who was Olivier de Serres the father of French Agriculture, or Evelyn the venerated author of the English Sylva, but *theoretical* farmers? Who was Duhamel the author of the best treatise on Fruits, and who contributed more than any other man to the present state of perfection of orchards, and of the finer fruits, but a theoretical man? Who has done the most in the present age to enlarge our knowledge

of this branch of agriculture and horticulture? Thomas Andrew Knight, of Downton Castle, near Ludlow, who has added more new varieties to our fruits than any man living. We shall shew in the course of the present number that his zeal for the promotion of horticulture has been liberally extended to this country.

But it has been intimated that this central society had arrogated to itself merits, to which it was not entitled; that it had been tardy to do justice to the great and meritorious exertions of the Berkshire Society. This is unkind; we have always been prompt to acknowledge the early, efficient and intelligent efforts of that society. We have admitted that they were the first to give a spring to agricultural efforts by introducing the British and French system of public shows of cattle and manufactures. Still too much must not be claimed on this score. It was not an original thought. Many of us had visited the European shows, and the subject of introducing them had been discussed, and there can be no doubt, that long ere this, they would have been in full operation from the successful effect of European example. This is not said with a wish to diminish the merit of Mr. Watson, Mr. Gold, Mr. Melville, and Mr. Mackay, and the "other Gentlemen" Farmers of Berkshire. We know and acknowledge that they have done every thing in their power to promote an enlightened and improved course of agriculture, and surely they may be contented with this merit, without wishing to deprive other societies of their humble share in this common cause.

We most earnestly hope never again to see any invidious comparisons. It is much more easy to find fault, than it is to discover and propagate useful improvements. *We are all novices*, much more behind the state of cultivation in the smallest state of Europe than our pride will admit. Either of the small Italian states, at least on the plains of Lombardy, or any district of the Netherlands could teach our best farmer that he knew but little of this important

art. Let us all then be modest in our conscious ignorance and defects.

We have a few remarks to make as to the matter and manner of this journal. No men can be more sensible than we are of its imperfections. How can it be more respectable, when the whole state is so deficient in agricultural knowledge? Till within a few years, there were no books to inform us what were the modern improvements in more thickly settled and cultivated countries. Our whole library is still extremely meagre. Yet we are reproached with introducing articles which are above the capacity of common farmers. If it be intended as an intimation that we devote too large a proportion of this work to philosophical agriculture, we deny the fact; we always give the preference to homebred, practical essays and experiments. But we are not ready to admit that the introduction of rational and scientific speculations, such as those of Kirwan and Davy is inexpedient. Massachusetts has scarcely a town which does not furnish educated men. Knowledge must be first communicated to them, and from them it will inevitably reach their less informed neighbours. We have devoted many pages to horticulture, to the best mode of raising vegetables and fruits for the table, and if we wish to rise one grade above mere subsistence, we must continue so to do. We shall devote a considerable portion of our journal to horticulture, orchards, and fruits. Massachusetts has fourteen large towns containing a population of one hundred thousand souls. When men are thus collected in great masses they will require the innocent luxuries of the table, and there are none more so than vegetables and fruits. To supply this population of one hundred thousand souls, fifty thousand at least must be employed. Thus nearly one third of the state are interested in acquiring horticultural information, in being taught to manage their gardens. Would you always continue in your present state of ignorance on these subjects? Shall it be said that from

June to September in our scorching summers, a traveller may traverse Massachusetts from Boston to Albany, and not be able to procure a plate of fruit, except wild strawberries, blackberries, and whortleberries, unless from the hospitality of private gentlemen? It is painful to reflect, that every cottager in Flanders, Germany, Holland, and England, is better supplied with summer fruits than our most opulent farmers.

This almost utter neglect of cultivating summer and winter fruits, materially injures the health of our farmers. How mortifying to see the finest climate for the cultivation of the apple, so undervalued, that many of our farmers are obliged to slice up their summer fruit, and suspend it in the front of their houses to dry, in order that they may have a comparatively insipid and tasteless provision for winter! Yet such is too often, I may say too generally, the case.

The greatest benefit, however, which our farmers would derive from an attention to gardening, would be the acquisition of habits of care and neatness, which would be transferred to their farms.

If each farmer would devote two acres to a garden, and to finer fruits, he would be compelled to be more careful in trimming his trees, in sowing his seeds, in keeping them free from weeds. The habits thus formed would extend throughout his estate. We see this effect in farmers near the great towns; they learn to be their own grafters, and pruners, and their care of their general culture keeps pace with their progress in gardening.

But perhaps it will be replied, we cannot afford the time; it will be too expensive. What! cannot our farmers afford as much time as the common labourers of other countries who work from sunrise to sunset for from thirty to forty cents per day? No, this is not the real difficulty. It is, that the ease of getting an ample support in this country relaxes our exertions. But the progress of manufactures and

population will soon bring about other habits, and we hope within a few years to see nurseries of the cherry, and the peach and the pear, as well as of the apple, in all country towns,—though we think, not only that the last is far the most important, but that it is with that, our internal improvements must commence. Till every farmer can lay up his ten barrels of excellent winter apples for his *own use*, we shall not expect much progress in other branches of gardening.



DR. T. W. HARRIS OF MILTON, UPON THE NATURAL HISTORY OF THE SALT-MARSH CATERPILLAR.

IN the present state of agriculture, hay has become an important product to the farmer in this vicinity. From the high price and the increased demand for the imported and cultivated grasses, the indigenous and natural growth of the soil must rise in value; and of this perhaps none is more valuable, on the seaboard, than that of the salt-meadows.

But various causes have contributed to disappoint our hopes in the crop of salt-hay, and among those, the most apparently unavoidable are the ravages of insects. Of these, the caterpillars and grasshoppers have become the most formidable, by the great extent and the annual increase of their devastations. Meadows, where they have foraged, are entirely stripped of their covering; every green blade disappears before them;—what the caterpillars have left being devoured by the grasshoppers.

The object of this paper is to attempt to elucidate the natural history of the former of these insects, with the hope that it may lead to some sure method of exterminating them, or of limiting their ravages to a shorter period.

Caterpillars were observed, upon the salt-marshes, bordering Charles' river, near Cambridge, some ten or twelve

years ago ; since which time they have gradually multiplied and extended over the contiguous marshes. They were once by a high tide and strong wind driven upon Boston-neck, near to Roxbury line, where they laid in "winrows," apparently dead ; but after the storm had abated they were resuscitated by the heat of the sun, and commenced their depredations anew, overrunning gardens in that vicinity and destroying every green leaf in their path. Thence, I presume, they migrated to the eastern side of the neck, and have followed the meadows as far as Quincy. To what distance they have spread on the north of Charles' river, I have yet to learn. They are also found on the marshes in Kingston ; but probably originated from a different source from those in the environs of Boston.

The salt-marsh caterpillars are produced from eggs, laid by moths in the middle of June, which are hatched in the air, in seven or eight days afterwards. These eggs are nearly round, less than a grain of mustard, and about eight hundred in number from one female. The caterpillars are small and feeble at first, eating only the most tender part of the blade of grass ; but rapidly increase in growth, and, in seven weeks or fifty days,* attain their full size, having repeatedly cast their skins. Individuals, at this period average one and three quarters of an inch in length. While growing they change the colour of their hair very remarkably ;—being nearly of a mouse colour when small, and of a brownish hue when fully grown. Of these, at maturity, there are two shades ; some being of a dun colour, and others much darker.†

The body of all true caterpillars is divided into twelve segments besides the head.

Each segment, in this insect, is covered with twelve yellowish tubercles, arranged, rather irregularly, six upon each side : from these proceed the hairs, giving the predominant

* They continue in the feeding state about as long as the apple-tree caterpillar, which is produced by the *Phalæna Neustria* of Linné.

† The dark coloured larva is represented in the drawing.

colour. The tubercles appear to be analogous in function to the bulbs of the hair in the human subject: they are, in truth, but common bulbs, from which tufts of hairs grow and are nourished, in the same way as each single hair grows and is nourished from its appropriate bulb. Between the third and fourth tubercle, on each side of the median* line, is a stigma or spiracle, of which there are eighteen, or two in every segment of the body, except the second, third, and last. The spiracles are the organs of respiration, and are the same, in number, in all the true caterpillars.

The colour of the body, divested of the hair, is yellow, shaded at the sides with black; and there is a blackish line extending along the top of the back. The spiracles are white and very distinct.

The hair proceeding from the three uppermost tubercles, on each side of a segment is almost black, as well as that from all the four first segments of the body. That from the tubercles at the sides is of a much lighter shade. On the two last segments of the body the hair is much longer than the rest.

This caterpillar, like most others, has eight eyes, four upon each side of the head. These are not to be distinguished without the aid of a microscope. They are situated just above those white feelers, so plainly seen attached to the upper lip. The eyes are here arranged in a semicircle, whose convex side is directed anteriorly.

The jaws are two, strong and corneous, and their operation, in eating, may be distinctly heard as well as seen.

It has sixteen feet;—six anterior and horny, and ten posterior and fleshy. These enable it to run with considerable celerity, as we may see, when the insect is at its full size; at which period it commences the wandering state, and leaves

* I have taken the liberty to employ this phrase, which is a technical one in Anatomy and Physiology, for that line which divides the animal into two equal and symmetrical halves, and I would indicate by it a dark line running upon the top of the back, the whole length of the body of this insect.

the meadows in search of a place of security for forming its cocoon.

These caterpillars are endued with a great degree of vitality; for long immersion in water does not destroy life. Being often exposed to that element, they seem provided with the power of enduring its approaches. They feed twice in the day; about ten o'clock in the morning, and four in the afternoon. If overtaken by the tide while feeding, they mount to the top of the grass; and then, if obliged to relinquish their hold, contracting themselves into a circular form, they commit themselves to the water. On this they float and are carried to the superior parts or borders of the marsh. There they are left, with the wash of the sea, in heaps, but alive, and in a short time ready to recommence their depredations upon the meadows. But when not engaged in feeding they conceal themselves at the roots of the grass, where they are equally secure from the effects of the water, even though covered by it. In this way also they pass the night. The hair, upon their bodies, appears to possess a repelling power, which secures the spiracles from the admission or access of the water; for, were this to be the case, the insect would be drowned. We should suppose that the tide, on receding, would sweep away many of these insects; but this is not the case: for in consequence of the irregularity of our shores, and of the power, which these caterpillars have of remaining, uninjured, on the surface of the water, for a long time, they generally gain some place of lodgment and safety.

Their most favourite food is the '*Onion-grass*,' which is very succulent;* but they are not fastidious, and eat with avidity '*Fox*' and '*Bottom-grass*,' and even '*Thatch*' and '*Sedge*.' Of the '*Black-grass*'† they are not so fond, probably because it ripens sooner than the others, and is found

* It is so full of juice as to be with difficulty dried.

† *Triglochin maritimum*, L. sometimes called the sea arrow grass. This is considered by Mr. Lowell as the most valuable species.

nearer the upland, and thus, before it is reached, it becomes too dry to furnish the juices by which they are nourished.

By the first of August, generally, these insects have attained their greatest size. They now become very voracious, and continue eating all the day and night, without intermission. Soon they leave the meadows, aggregated in great numbers, and commence the wandering state, or 'begin to run,' as is the phrase, devouring every thing in their progress. Corn fields, gardens, and even the coarse and rank produce of road-sides afford them temporary nourishment, until they have found a place of security from the tide and weather, and concealment from their enemies of the animal creation. A stone-wall, a wood-pile, fencing-stuff, and even hay-mows and stacks are the resorts of these caterpillars, where they intend to take up their winter quarters, and construct their cocoons. I have heard of their being dug up, in vast quantities, from the ground upon the edge of a salt-marsh; but, in this instance, it is probable that, being prevented by ditches in their attempts to escape from the marshes, they were prompted by instinct to take refuge deep in the bank.

The cocoons are formed of silk interwoven with the hairs of their bodies, and lined with a silky lamina of a dense texture. These cocoons retain the colours peculiar to the caterpillar; those being brown, which are fabricated by the dark larva, and the others much lighter coloured. If we examine the recent cocoon, we shall find the caterpillar within it entirely destitute of hair, and much contracted. In a few days it casts its slough, and becomes a chrysalis, of a dark brown colour, and about three quarters of an inch long.* In this state it passes the winter, and, within the first and twentieth of June, the moth emerges from its chrysalis and cocoon, and flies towards the meadows; where, after the hymenaeal rites are celebrated, and the eggs deposited, it dies.

* This is their average length; but some are longer and larger, as those represented by figures 2 and 3.

The moth is the perfect state of the insect. There are two varieties, as to colour, corresponding with the caterpillars from which they are produced. From the dark caterpillar and brown cocoon proceeds a moth with ash-coloured wings; and, from the lighter coloured larva and cocoon, is disclosed a moth whose upper wings are white, as are also the under wings in some individuals. These colours do not designate the difference of sex: for though the upper wings¹ of the male are invariably white, those of the female are not as invariably ash-coloured; but this difference or variety of the female will be more distinctly described below. I would also mention that the male, and the light-coloured variety of the female, both proceed from caterpillars and cocoons of the same colour.

The male moth will be first described.

Head and thorax white; eyes black; antennæ black, and doubly pectinated. Body orange-coloured, with six black spots on the top of each ring, and a white line between a double row of black spots on each side;* beneath the abdomen is a single series of four or five small spots: tail white. Upper wings white above, orange coloured beneath, spotted with black upon both surfaces: under wings both above and beneath orange-coloured, with a few large black spots. Thighs orange coloured; legs and feet white, spotted or banded with black.

Female—Head, thorax, tail, both surfaces of the upper and under wings, under part of the abdomen, and the thighs entirely ash-coloured. The wings are spotted with black. Upper part of the abdomen as in the male. Antennæ doubly (but slighted) serrated, not pectinated.

Variety of the female—Head, thorax, and tail, white. Upper part of the body as in the male. Upper and under wings white upon both surfaces, and spotted with black. This variety very much resembles the male, when the wings are clos-

* The upper consisting of six, in number and size corresponding with those on the back, and the lower of 4 or 5 spots, which are smaller than the former.

ed, for then the under wings are not to be seen. It is however easily distinguished from the male by its antennæ which are serrated : and when we examine the under wings, and the inferior surfaces of the upper wings, and body, we find them to be destitute of the yellow or orange-colour, peculiar to those parts of the male.

I would only add to this description, that the moths, of both sexes, are furnished with a short tongue, separable into two filaments ; and have also two scaly palpi, above the mouth.

This insect is closely allied to several others, very common in Europe, and some of which are also found here ; such as *Bombyx lubricipeda*, *Bombyx erminea*,* &c. These form one family, and are arranged under the genus *Arctia* of Latreille, and Leach. This genus contains those moths, which have two scaly feelers ; pectinated or ciliated antennæ ; a short membranaceous tongue, composed of two, separate filaments ; and trigonate, deflexed wings : the caterpillar having sixteen feet.

Professor Peck, to whom this moth was shewn, considered it as a nondescript ; and proposed to call it *pseud-erminea*, bastard ermine, from its affinity to the above mentioned *Bombyx erminea*.† I would therefore define the subject of this memoir.

Arctia (*pseud-erminea*) alis masculis anticis albis ; posticis fulvis, utrisque nigro punctatis : tergo fulvo, sex maculis nigris suprâ notato ; ventre quinquefarié nigro punctato. Fœmina variat alarum colore.

Larvæ gregatæ ; verrucis luteis piliferis.

Pupa folliculata.

Interdum maculam septimam super postrema corporis parte videmus. Fœmina alis (anticis posticisque concoloribus) albis vel cinereis, nigro punctatis.

* *Arctia lubricipeda*. Leach. *Arctia Menthastri* ?

† *Bombyx* (*Menthastri*) alis deflexis albis nigro subpunctatis ; abdominis dorso fulvo, nigro punctato ; femoribus anticis luteis.

Abdomen album, quinquefarié nigro punctulatum ; dorsoque fulvo. Antennæ subtus nigræ.

Fabr. Entomolog. Systematica.

There are two facts, in the history of these caterpillars, that should be ascertained. First—the place where the eggs are deposited; this I have not as yet been able to discover; those eggs, which I obtained, were laid under glass vessels upon paper. Probably they would be found around the culm of the grass, or regularly arranged upon the leaf. Secondly—whether, by bringing home, with the hay to our barns, the caterpillars when fully grown, we are not liable to introduce them eventually into our uplands, where they might become as it were naturalized; and thereby increase the evils we already suffer from their devastations. This we have some reason to fear; since we know that the caterpillar at one period, (and that sometimes for several days,) feeds indifferently upon all green herbage. Some observations, made upon doubtful specimens of the larva and perfect insect, found occasionally on the uplands, favour this opinion. The peculiarities in the appearances of these specimens may possibly have arisen from a want of the food most natural to the caterpillar. Still both these points are as yet merely matters of conjecture; further examination must establish or refute them.

From observation and experience I would recommend the following plan, by which we may lessen the evils that we suffer from this enemy.

First, to cut the grass early in July; and secondly, to burn over the marshes in March. In defence of early mowing, it may be said,—that it is the only way by which we may save the crop from those meadows where the caterpillars have multiplied to any extent. The preceding history furnishes the data, from which to calculate the best time for effecting this purpose.

We have seen that the caterpillar is hatched about the twentieth of June, and that its ravages are continued seven weeks. If then the meadows, in our vicinity, are mowed about the fourth of July, the caterpillars, being small and feeble, will be deprived of their means of nourishment, and be-

ing unable to wander far, will die, before the crop is gathered into the barns. By the process of making the hay, most of the succulent juices are evaporated, and the grass becomes so dry and hard as to resist the efforts of these little devourers. Thus we see that the Black-grass, by ripening early, is rejected by them, and the crop is saved.

By the practice of late mowing, where the caterpillars prevail, the crop is diminished, immense numbers of caterpillars and grasshoppers are left to be dispersed upon the uplands, to multiply and increase the existing evil; or are brought in to perish in our barns and stacks, where they communicate a most unpleasant flavour to the hay, rendering it unpalatable to our stock, and occasioning a waste of fodder.

Many beneficial effects result from burning over the marshes in March. This has been long practiced in the British province of New-Brunswick, and is getting into use in this vicinity, to the manifest improvement of the crops. By it the stubble or "old fog" is consumed, which becomes more necessary from early mowing, in the preceding year. By this means also we may destroy innumerable eggs and larvæ of grasshoppers concealed in the grass* the past autumn, and which, if matured, would produce a host more formidable than that of the caterpillars themselves. The roots of the grass are not injured by burning the stubble; they are fertilized by the ashes, and in a short time afterward we shall be gratified by seeing the grass springing from the blackened surface with increased strength and fresher verdure.

The preceding observations on the history of these insects, are the result of the inquiries, investigations, and experience of the writer for several years; and the practice here recommended is one that was first suggested by necessity, and whose good effects have been reaped by many.

This little memoir is offered to members of the Massachusetts Agricultural Society, with the humble hope that they

* De Geer.

may derive some profit from what has been a pastime to the author.

T. W. H.

Milton, 1822.

EXPLANATION OF THE FIGURES.

- Fig. 1. The full grown dark caterpillar.
- Fig. 2. View of the abdomen of the chrysalis.
- Fig. 3. A side view of the chrysalis.
- Fig. 4. The male moth.
- Fig. 5. The female.
- Fig. 6. The male moth with wings expanded.
- Fig. 7. Variety of the female moth with wings expanded.
- Fig. 8. Antennae, of the male moth, magnified.
- Fig. 9. Antennae, of the female moth, magnified.

SOME NOTICE OF THOMAS ANDREW KNIGHT, ESQ. PRESIDENT OF THE HORTICULTURAL SOCIETY OF LONDON. HIS EXPERIMENTS AND PRESENT TO THIS SOCIETY.

[By the Corresponding Secretary.]

IF any apology could be necessary for the brief and imperfect notice which we are about to take of one of the most distinguished cultivators of the age, of a man who has done as much to enlarge the boundaries of theoretical agriculture, and horticulture, as any man living, while he has at the same time done more than any man with whom we are acquainted to advance that science *practically*, it will be found in the kind expressions of his regard for *our country*, and his generous exertions to make *us* partakers of the improvements he has actually effected in his *own*. To those who may be disposed to consider horticulture as less interesting and less within the province of this society, we would observe (at the hazard of *repeating* and *reinforcing* the remarks we made in

first article) that it is precisely the branch of agricultural industry which in *our* country needs the most attention. It is the one in which we are most deplorably deficient. So long as we were surrounded with Indian neighbours, and our crops were so precarious that our only anxiety was to procure bread corn sufficient for subsistence, it was natural, that we should be indifferent to the rich profusion of vegetables and fruits, which nature has provided for our luxurious enjoyment. In this particular, we can without blushing, compare ourselves with the European nations at a period not far distant; and when we learn that the water-cress was the only sallad for the royal table in the reign of Queen Elizabeth, we may not be surprised at the scanty supply of our own tables, fifty years since. But we are past that age, and we see no reason, why we should not have the finest melons of Persia which we can grow in the open air, while a Russian Prince *will* enjoy them in spite of nature, by expensive hot-houses heated by steam. We feel only a sentiment of humiliation, when we reflect, that countries which the sun never heats, produce the most luxurious fruits, while *our* sun wastes its powers in many parts of our country on a rich and productive soil, which is applied, in most cases, to the raising of the coarse vegetables, which our Indian predecessors bequeathed to us. In this remark, we refer only to vegetables for the table, not to our invaluable staple articles.

Much has undoubtedly been done in the vicinity of our great towns, and horticulture has within our memory made a progress equal to our growth and improvement, but much remains to be done even here, and the inhabitants of the country at large may be considered as to horticulture, in a state of nature, excepting always some liberal, and spirited individuals who have made horticulture their study. After the provision for the support of life, come our comforts and rational luxuries, and if these can be obtained, without neglecting the more substantial and important articles, it is our interest to procure them. This is our apology for introducing the character, discoveries, and exertions of Mr.

Knight. He has devoted his life to the investigation of the physiology of plants, and it has been his rare merit, to submit his theories to the *best test*, that of experience. He no sooner settled a principle than he undertook to shew its truth by actual experiment, and to prove its importance, by applying it to the practical amelioration of horticulture. He early announced, that individual varieties of plants have their *limited* age; that although by culture, and in favourable circumstances, they may survive that age, they generally after that period decline and become weak, and of course unprofitable. With respect to the potatoe, he ascertained with as much precision as the nature of such a subject will admit, that the specific varieties do not last in perfection more than fourteen years. No observing man in any country could doubt, as to the temporary duration of the varieties of this vegetable, however he might question the accuracy of the *precise limits assigned by Mr. Knight*. There is not a single variety of the potatoe now cultivated with us with which we were familiar thirty years since; and within twenty years, we have known several sorts which were invaluable, gradually run out; and this too, not from any want of attention, but from the impossibility of raising them. We will mention two sorts, as examples, the round cranberry potatoe, better than any now in market, a great bearer, excellent in the spring after other potatoes become flaccid and watery. We continued to raise them, till they would not produce double the amount of the seed put in. They are now *extinct*. Another was a blue potatoe, with white spots—a delicious variety, brought from England direct, and also from Connecticut. For the last four years, it has become extinct. Some persons are deceived by appearances. We have always *white* potatoes, and they think them the same, but the varieties are infinite, and are constantly changing. The long reds, called the River Plate potatoes, have essentially changed their character, and ten years hence we shall no longer see that very valuable variety. So far our experience fully supports the theory of Mr. Knight.

Mr. Knight, if not the first to suggest the mode in which

the sap circulates in vegetables, was, we are persuaded, the first who proved it to the satisfaction not only of men of science, but of the most incredulous and ignorant. Some of his early experiments were made on plants whose parts are transparent. He took, we believe, the Balsamine, or "Touch me not." He watered it with a coloured fluid. He saw that the fluid passed up in the central parts of the plant, made its way into the leaves and having coloured them, it returned by the bark which was the last affected. For the information of those who have not attended to the structure of plants, it may be remarked, that they consist of an external covering which is generally very thin, called the Cortex; of a softer substance, which is usually confounded with the other, called Liber; of a white portion, called by botanists, Alburnum, and commonly known as "sap wood;" and the Heart-wood, which in more durable trees is usually much the most dense and solid. Mr. Knight maintained that the sap ascended in the Alburnum and descended in the bark, or between the bark and the Alburnum, where it made its deposit of new wood. This theory was not without its *practical* value. It explained the reasons of the fact of the destruction of trees by decortication or a *too great removal of the bark, if accompanied with such wounds in the Alburnum as to prevent the formation of new bark.* It was known before, that you might cut off half the top and half the roots of a tree and it would still flourish, but if you should make a wound of one inch wide through the bark, and into the Alburnum, the tree inevitably perished. His theory led to various experiments, founded upon its undoubted truth. Mr. Williams of Great Britain applied it to the early maturation or ripening of grapes, by taking off the bark to the extent of a quarter of an inch in width; it was found that the sap was impeded in its descent, the parts above became larger, the fruit swelled and ripened *earlier and was more large and fine.* This experiment was repeated in this country by the writer of this article, and its success was so perfect, that nothing could

be said against the theory by those who were eye witnesses of its extraordinary effects. Another consequence followed from this discovery of Mr. Knight. If fruits can be hastened to maturity, and enlarged and improved by partial and prudent and judicious decortication, why, it was asked, may it not be applied to the bringing trees earlier into bearing, than by the ordinary process of nature? This it was said would necessarily be the effect of detaining the sap preternaturally in the branches, and thus forcing the plant to produce blossom buds instead of leaf or branch buds. It was before well known to gardeners, that any thing which checked the growth of a fruit tree, hastened the production of fruit. It was reserved for Mr. Knight to shew the *causes*, and to submit the whole process to rules as certain as are known in any other branch of natural science. In *all*, we are stopped at certain points, when we rashly venture to penetrate the great secrets of nature, but this is no reason why we should not search as far as we can find intelligible explanations and facts.

Perhaps it would be satisfactory to our readers to have experiments *at home* stated to them, in support of Mr. Knight's theories, and we trust that due credit will be given to our statement of *actual* experiments, especially as nothing would give us more pleasure than to afford any cultivator the most perfect satisfaction as to the accuracy of these statements, if he will do us the honour to call and examine the subjects of our experiments.

On two orange-trees from St. Michael's, which had never borne fruit, though we had had them many years, we practised decortication, taking off a ring of the bark of half an inch in width. In the following spring, this year, the gardener expressed to me his surprize, that those limbs were literally loaded with blossoms. He had not been in the secret. We pointed out to him the decortication or ringing, or as we say, the "girdling," and it was found, that while every other part of the tree was without blossoms, those which were operated

upon were *far too greatly covered* with them. In this case we committed a mistake. The orange-tree puts forth only once in a year ordinarily in our climate, or under favourable circumstances, twice. Ringing or girdling should only be executed when the sap is in the greatest possible degree of action. These limbs are not healthy, and we fear will not hold their fruit, but the experiment shewed the principle in its clearest light. The general rule is, to girdle when the tree is in its most rapid state of growth, to make the decortication or ring larger or smaller according to the vigour of the plant, but so little in all cases as to enable the tree to close the wound during the same season. We made a similar experiment on a flowering plant, the beautiful *Passiflora Alata*, and we threw it by this process into flower, at a season in which it never flowers in the ordinary course of nature, that is, in the month of August. Its usual time of flowering with us, is October and April.

But we proceed to experiments out of the green house, within the reach of *all* cultivators. We tried this plan on 20 young pear trees, on one, two and three branches—trees, which have been grafted from 10 to 12 years, without giving fruit. The spectacle on so extensive an experiment, is really interesting and instructive, as shewing the power of human art over nature. A single branch in a tree is at this hour, when we are writing, absolutely snowy white with flowers, while every other branch on the same tree is as barren, and unprolific, as it had been every preceding spring, when it had blighted our hopes. We sported very much in our experiments. On some trees, we girdled one, and on others 2 to 5 branches, but the experiment is so perfect, that before you reach the tree, you can decide precisely which were and which were not girdled. The same experiment was made on plums, with equal success.

Let us here, however, check any disposition which may have been excited in favour of this mode of hastening early bearing, by saying, that Mr. Knight, from whose theory the

experiments have been derived, is opposed to it on a *general scale*. He thinks it will shorten the longevity of the trees subjected to it; that it is adverse to the course of nature, and is only justifiable when you wish to be certain, whether the trees you have *bought or grafted* are really what you *supposed they were*, or when you have new seedling fruits, to enable you to ascertain some years earlier their qualities, in order to decide, whether you should reject them or not. I do not carry my apprehensions so far (I say it with great diffidence) as this learned cultivator. The effect of judicious girdling is nearly the same with *grafting*; that produces a similar interruption of the sap, a callous is formed between the original stock and the graft, and yet we see the branches continue productive, and enjoy excellent health. No doubt great discretion and prudence should be exercised in the application of it. Mr. Knight has adopted other modes of hastening the early production of fruit on young trees. Some he raises in pots and boxes, others he bends down either to an horizontal, or even to an *anti-perpendicular* form, if we may be allowed a novel expression. The sap is thus impeded in its course, and Mr. Knight has shewn, that the principle of gravitation is as operative in the fluids of *vegetable life*, as in others. The effects are nearly the same as those of girdling, producing earlier bearing.

But these are but a part of Mr. Knight's labours and services. Following up the Linnæan theory of the sexual system of plants, (or to speak in language better adapted to all classes of readers,) proceeding upon the well established fact, that certain parts of the flower, called Anthers, produce a dust called Pollen, which is indispensable to the fertilization of the germ or fruit, a fact known to be true, before Linnæus existed, but which never received perfect confidence, till he demonstrated it. Mr. Knight has devoted 35 years of his life to the practical application of this theory, which he has not only demonstrated by hundreds of experiments, but he may be said to have created many new and valuable varieties of

fruits hitherto unknown. He has obtained new varieties of the pear, the apple, the grape, the plum, and the strawberry. He has demonstrated, that we can correct the defects of one variety of fruit by another, by introducing the farina of a pear for example, which has too much austerity or acidity, into the flower of another pear, which has too much sweetness, too insipid a sweet, you may give to the new product a taste and flavour, which may be perfectly agreeable. So it has been ascertained by Mr. Knight, that by the same process, a fruit which is defective in vigour, which bears with great reluctance a cold climate, may, by intermixing it, or coupling it with another tree of the same species of a hardy character, acquire the vigorous constitution of one of its parents, and still retain the excellent qualities of the other parent. There is, indeed, no end to the changes which have been produced by Mr. Knight and others, not in fruits, but in flowers, by this process. We are aware, that this statement, to those who are ignorant of his exertions and success, may seem to be extravagant; but we can affirm, that he has done more to improve horticulture than any person of whom we, in this western world, have any knowledge.

These remarks were intended as an introduction to a notice of the efforts which Mr. Knight has generously made to communicate to America some of his improved fruits. In 1822, I had occasion to write to Mr. Knight to procure the last numbers of the Horticultural Transactions, for the College; he replied to my letter in the most friendly manner, appeared to be highly gratified with opening an intercourse with our country, expressed his strong attachment to it, his disgust at the libels on our country in some of the presses of Great-Britain, and his intention to send to us the best new fruits which the late improvements had introduced; declaring at the same time, that though he should confide them to my care, it was under the full belief and expectation, that I should disseminate them as extensively as possible. I need not say, that he could not have given me a charge more agreeable; and that with-

out the smallest regard to personal interest, I shall circulate as rapidly as possible, by buds and scions, every variety of fruit he may send. I shall consider myself steward for the public—but I ought to remark, that as he sends but one individual specimen, the progress must be slow; and that I must exercise a discretion in giving scions and buds to such persons as will be most like to take good care of them; but I shall do it in all cases on the express condition, that the same freedom of circulation shall be practised by all.

I shall close this article by inserting Mr. Knight's last letter to me, accompanying certain fruit trees sent this spring—

“*Downton Castle, Feb. 15th 1823.*”

“JOHN LOWELL, Esq.

“*Dear Sir,*—I have this day sent to Messrs. Thornely, of Liverpool, to be forwarded to you, a box containing trees and grafts of *ten new varieties* of pears, which *here* ripen in succession from October to May, and which I conclude in your warmer summer climate will ripen in succession—I could have sent a larger number of varieties, but those sent are the best and the most productive, and inferior varieties that would ripen at the same seasons, I did not think worth sending. Each tree has a label and is also numbered besides, and I will now give you a *concise description* of each variety. I have also sent grafts of each variety from *bearing trees*, that you may certainly have each variety.

No. 1. Cassiomont—a large pear, yellow upon one side and red upon the other. ripens in October.

No. 2. Tillington—This is described in the Horticultural Transactions. It is perfectly melting or rather perfectly beur-*rée*, and very rich, sprang from a seed of the autumn bergamot, —and the pollen of the Jargonelle, and its form is precisely such as you would expect from such a mixture. It is ripe in November.”

[N. B. by the Corresponding Secretary.]—(This example will shew our cultivators the process of Mr. Knight and the great changes produced by it. He removed from the flowers

of the autumn Bergamot all the anthers. He impregnated the germ with the pollen of the Jargonelle. He took the seeds of the fruit, thus obtained, sowed them, and produced a *new pear*, having a mixed form, between that of the Jargonelle, which is long and eminently pear shaped—and that of the autumn Bergamot, which is flattened, and rather apple shaped—and it ripens nearly two months *later* than either of its parents. Being a new seedling, it will have strength and vigour and endure many years. Mr. Knight computes the longevity of a new variety of pear at more than 150 years. We may then form some judgment of the value of such an acquisition, when we know and have perceived for many years the gradual deterioration of the St. Germain, St. Michaels, Chaumontelle, &c.)

“No. 3. Urbaniste—A large and nearly globular pear—colour yellowish green—the flavour of rose water. Season, November.

“No. 4. Beurré Knox—Large, pear shaped, yellow. Season, November and December, an excellent pear.

“No. 5. Marie Louise—Middle sized—colour, pale yellow. Season November and December, a most excellent variety.

“No. 6. Napoleon—Somewhat smaller than the Marie Louise, exceedingly melting and juicy. Season November and December.

No. 7. Florelle—Middle size and pear shaped, colour bright red, nearly scarlet, with minute dark points, a most beautiful and excellent variety. Season November.

“No. 8. Colmar d’ Hyver—Shape varying from nearly globular to pear shaped, colour yellowish green. Season January—a melting pear of first rate excellence and very productive.

“No. 9. Passe Colmar—Large and pear shaped, but very broad towards the eye. An exceedingly fine melting pear, which by being kept in different temperatures, may *here* be brought to table in perfection from the beginning of January

to the middle or end of April. This variety is productive to a fault. I am generally obliged to take off 9-10ths of the fruit.

“No. 10. Hardenpont de Printems*—A large pale green pear with rather a rough skin. It ripens *here* (in England) in the end of April or beginning of May—and its flesh at that period nearly resembles that of the Brown Beurré in Autumn. It is a very productive variety, and in *your climate* will, I believe prove the most valuable variety of all.

“No. 11. Gilliflower apple—*Grafts only sent*—Form angular flesh perfumed and remarkably yellow. It is in perfection in *winter and spring*. It would afford in a warmer climate a most excellent cider.

“No. 12. Sweeney Nonpareil Apple—A very large variety of the Nonpareil, very excellent ripened on a south wall, or in a very warm season, and good situation, but too late for *our climate*. I believe it would suit yours. It is entirely new.

“No. 13. Black Eagle Cherry.

“No. 14. Elton Cherry.

“No. 15. Waterloo Cherry.

All these cherries are new varieties produced by Mr. Knight—they have been described in the horticultural transactions and coloured plates of them given—they have all of them valuable properties.

It should be recollected, that Mr. Knight often fails in his numerous experiments, and it is only the excellent new varieties which he presents to the public.

“No. 16. Downton Cherry—It is a white or pale red cherry with white flesh, and it is believed will prove an excellent variety.

No. 17. Cooes Golden drop plum—A fine variety from the original stock.

* So named I have observed from Monsr. Hardenpont of Mons in Brabant, who raised it as a seedling. It is christened by the French Gardeners Beurre Rance, but the English cultivators give credit to its creator, or raiser.—*Cor. Sec.*

No. 18. A very large new plum of a green colour, which promises well.

Mr. Knight added also two hundred Downton Strawberry plants ; a new variety, but they perished in the passage.

The trees were admirably packed, and although they started more than could have been desired on the passage, yet there is no doubt we shall save every variety except perhaps one or two of the cherries—but had they all perished, our feelings towards Mr. Knight would not have been affected. His good intentions—his kindness towards our country, his philanthropy, would not have been the less. Unsolicited, he has bestowed upon us, what is of no small value, independent of the excellent intention. One new, and excellent variety of fruit is a great gain. How much have the St. Germain and St. Michaels Pear contributed to the pleasures of our tables? Who would not be pleased to have *ten new and excellent varieties* of pears, in the prime of youth, to supply the place of these, which we must soon lose? We trust we shall find some apologists for the zeal with which this article is written. There is something so kind, in this intercommunication between cultivators of different countries ; it seems to be such a forgetting of the old circumstances of separation, that one cannot but be pleased with it.

PASTEL, OR WOAD, AND ITS CULTURE.

WE insert with great pleasure, the following communications on the culture of Woad, (*Isatis Tinctoria*), and General Dearborn will permit us to express our sense of the obligation, which the public are under to him, for his continued efforts to introduce the cultivation of this plant, now so important

to our manufactures. During the late war, General Dearborn made some interesting experiments on a small scale, to prove the *practicability* of raising this important dye-stuff in the United States. Though his experiments were not extensive, they were entirely satisfactory. He did more. He compiled and wrote, and published at his own expence, a treatise on the culture of this plant, which contains all the information necessary for a cultivator of it. The peace came; with it, low prices; and the subject lost a portion of its interest. But great changes have been wrought during the last seven years, and the culture of woad has again become a subject of deep interest. The fact, that an extensive manufacturer, like Mr. Crowninshield, has found it for his interest to cultivate this plant, and has proved its value practically, seems to set the question at rest. We invite our cultivators generally, to read with attention these communications, to procure Mr. Dearborn's work on Woad, and to make some moderate experiments upon this article.

Mr. Dearborn's letter to Mr. Lowell, April 9, 1823.

Dear Sir,—I inclose a letter from Richard Crowninshield, Esq. on the cultivation of woad, which, if you think proper, please to cause to be inserted in the Agricultural Journal. It is the largest experiment that has been made in this section of the country. It shews that our manufacturers can raise this valuable article for the dyeing vat, at little expense, and with great ease.

With great respect, your most humble servant,

H. A. S. DEARBORN.

Extract of a letter from Richard Crowninshield, Esq. of Danvers, to Brigadier General Dearborn, dated March 29, 1823.

“ I planted about 5 acres with 9 bushels of woad seed, in 1822, some of which seeds you was so obliging as to present to me. The remainder was procured from Connecticut, New-York, and some were of my own raising in 1821, from

seeds received from Dr. Nichols, in 1818. There was no difference in the plants raised from these several parcels of seed. The soil was light, dry, and sandy. The land was broken up in the spring of the same year. The sods were removed, and the land crop ploughed, harrowed, and furrowed out $2\frac{1}{2}$ feet between the furrows. About 40 cords of good compost manure, (consisting of horse dung, cow dung, and pig manure, mixed with about one-fourth part of its bulk of bog turf, which had been in heaps about 2 years, with some ashes, lime, &c.) were spread on the land and ploughed in as for Indian corn; the furrows were slightly earthed. The quantity of seed 2 bushels to the acre. They were sown rather thickly in the furrows, in order that in gathering them, there might be a full handful of plants to crop at the same time. The seed was lightly covered. It was all sown before the 20th of May. It grew well, but required 5 or 6 men to keep down the weeds in July. It was all picked or twisted off quite to the ground. It was then again cleared of weeds, and in 14 days the new leaves were from 9 to 14 inches long in rich spots. The second crop was gathered from the 15th to the 20th of August, and produced about 4 tons of green leaves, about one ton less than the first crop. The dry weather prevented a third crop from being taken. *Some leaves* were however taken in October, 5 inches long, but I preferred to let them generally remain to protect the plant against the frost, *having the last winter lost* an acre of woad, and an acre of teazels, by frost. The loss in woad was much less than in the teazels; the plants which I lost of the latter would have sufficed for 4 acres, and have produced much money, being worth from 50 cents to 75 cents for every hundred plants. All the woad plants are now alive, (that is, on the 29th of March, 1823.) and have grown half an inch. I have also many thousands of teazel plants in good order.

“The expense of cultivating woad is about equal to that of cultivating onions, and 10 men will crop an acre in a day.

“There is something remarkable in the woad plant. Some

roots which produced seeds last year, sprouted again from every joint like cabbage sprouts. They are now again sprouting from under the snow, the leaves are green, and may again be cropped this spring. *I shall have a great quantity of seed to dispose of at \$1,50 per bushel. I paid 2 dollars. There are but few men in America who understand perfectly the preparation of woad for the dyer. Our farmers, should it become the policy of the nation to raise and manufacture all our own woollen goods, equal to the national consumption, will probably find it for their interest to raise woad, and deliver it green or dry, (as may be most convenient for them) at regularly established mills, exclusively devoted, as in England, to this article. Inclosed you have an article from the New-York Statesman on woad."*

The article referred to from New-York, is interesting, and is, therefore, here inserted.

N. B. Gen. Dearborn has still a few copies of his work at the command of persons disposed to cultivate the woad.

AMERICAN MANUFACTURES.

Extract of a letter from Cincinnati, Ohio, to the editors of the Statesman.

"Having seen several communications in your valuable paper, respecting the *art of dyeing* and the cultivation of the *woad plant*, by which it seems that manufacturers in your part of the country are doubtful, whether woad can be produced in the United States, in the same perfection as in England, I have thought proper to state, for their information, that in 1821, I planted two acres, and found the produce to be at least one fourth more in quantity, having cut *seven crops* during the season. In England, I never knew more than *five*. Its strength, as a mordant, exceeded the English at least one third, containing three times the colouring matter I have ever found in any woad, after an experience of forty years, in an extensive trade in England.

I herewith forward to you some patterns of wool, dyed
Vol. VII.

with this woad, and regret I had not preserved some coloured with woad only, by which artists acquainted with the subject, would know its superior qualities. I have always observed in England, that our woad plant produces more in quantity and better in quality, in a warm season; and I attribute its great perfection here to the same cause.

Your manufacturers of woollens cannot fully succeed until they become well acquainted with this useful plant, as no good blue, black, green, or purple colour can be produced without it. All other modes are imperfect, expensive, and mischievous. Having made this country my home, I shall take pleasure in communicating this knowledge, to any one that may need it, for a moderate compensation. *Written directions* may be given for growing and preparing woad, without any chance of error; *but to use* it properly, requires considerable attention and good instructions.

I suppose it may be produced for three or four cents per pound—perhaps for something less. I have sold some of mine at Baltimore, this season, for 12 1-2 cents, by which you will perceive there is great profit in its cultivation. In my opinion no substitute for woad will be found worthy of attention, although it seems your friend *Hopson* thinks he has discovered one, which will answer the purposes both of woad and indigo. Your correspondent will confer a favour on me, by giving a description of the wild indigo plant, as he terms it. I will investigate its properties, and communicate the result to him.

Your correspondent who has written on the *scarlet dye*, appears to be acquainted with only a part of the theory of that art, as two essential ingredients are not mentioned, one of which I have seen since my arrival in this country. Your friend is also in an error in supposing he can render colour more brilliant by using steam. I have made use of steam in dying for nearly thirty years, and am well acquainted with its advantages and disadvantages. It is a cheap and expeditious mode; but it cannot be used for fine colours, such as

Saxon blue, green, pink, crimson, scarlet, orange, yellow, and all other delicate colours, *but at the expense of their beauty.*

All dyers should know, that when bright colours are wanted, the first step to be taken is to clear the water of all mineral and animal substances. This is all that is necessary to prepare the liquor for any bright colour; but if raw water be added, or steam suffered to flow into the vessel, the beauty of the colour will be destroyed, in proportion to the quantity admitted."

The letter, from which the foregoing is an extract, adds a number of other particulars, connected with the subject of manufactures. It states, among other things, that large quantities of Fullers' Earth are said to be found on the banks of the Wabash; but after diligent search, none, in a pure state, has yet been discovered in the vicinity of Cincinnati. Our correspondent has put to us the following questions, to which we hope some one will furnish satisfactory answers, as we are unable to do it ourselves:

1. What quantity of woad would be consumed annually, in the vicinity of New-York and Philadelphia, estimating one pound of woad to five pounds of wool, dyed of a dark blue?

2. Would the manufacturers give a reasonable compensation to be instructed in the art of dyeing generally?

3. Whether it would answer any good purpose, for a person who understands the manufacture of woad and its various applications in the art of dyeing, to establish himself in this part of the country?

It is proper to remark, that we are wholly unacquainted with the writer of this letter; nor have we a sufficient knowledge of some of the topics embraced in his communication, to judge of the accuracy of his remarks. *Hopson* will be able to speak for himself, where his correctness is questioned.

The beautiful specimens of colouring, accompanying the letter, may be seen at this office, where the name and address of the gentleman who forwarded them may be obtained.

[The following extract of a letter from a clergyman in Illinois was sent to us by Dr. Benjamin Shurtleff, together with samples of the seeds of the two plants described. If for no other reason, our respect for Dr. Shurtleff, whose exertions as an agriculturalist merit the gratitude of the friends of agriculture, would have induced us to publish the letter. The seeds reached us too late for cultivation last year. We shall give them a fair trial this season. We are not very sanguine on the subject. A plant, which may succeed well in Illinois, may be of little value with us. For example; the Illinois or Pecan nut, (*Juglans Olivæ-formis*), so frequent at our tables, will barely exist in our climate. Its shoots are annually destroyed, and it is ascertained by our own experiments of seventeen years patient duration, that it will never be a fruit-bearing tree with us. We cannot, therefore, calculate, that an Illinois plant will of course be successful in New England. Besides, though a substitute for chocolate or coffee may be very well in the remote prairies of that state, it may be of little value to us. But they may succeed, and perhaps prove as valuable as millet, which seems at present to be acquiring favour. They may prove valuable as *green-fodder*. We shall try them this year and render a faithful account of their growth and properties. Dr. Kilham of Wenham has, we believe, the oldest Pecan or Illinois nut trees in the state. We should be glad to be informed whether he or any cultivator in the Middle States has succeeded in producing ripe nuts from this tree.]

Copy of a letter from the Rev. Jesse Townsend to Benjamin Shurtleff. Townsend Prairie, Montgomery County, Illinois, April 20th, 1822.

RESPECTED SIR,

FROM the representations which my friend Mr. Tillson has given me of your disposition to encourage the agricultural interest of the United States, and from an inclination on my part, to co-operate with you in the promotion of these interests, I take the freedom although a stranger to present to you by the bearer, a small quantity of the *Holcus Bicolor*, or Broom Chocolate, also some of the *Orka Coffee*, and just a small specimen of cotton, which I raised last season on my plantation.

The *Holcus Bicolor* resembles in its growth and stalk the broom corn, and is very productive. It is, when rightly prepared, equally good and nutritious as the best of chocolate and affords a very healthful substitute. The way in which

my family prepare it for use, is to grind the seed in a coffee-mill, merely cracking it, then put about three gills into about six or eight quarts of boiling water, with milk and sugar, and boil all together, about five or six minutes, when it is fit for use. Some however, have the seed ground in a grist-mill and after sifting out the bran, mix with the flour a small quantity of butter, and then boil the same with milk and sugar, according to our method of preparation and give this method of preparation the preference. I believe we may easily raise sixty bushels of this grain on an acre, upon our rich Prairie, and that it may do very well on good ground at the North. It ripens about the same time with Indian corn. It ought to be planted at the usual time of corn planting, in hills about three feet apart, and about six or eight seeds in a hill.

I wish you to make trial of this grain, and if it succeeds well to introduce it to public notice in your vicinity.

The Orka is to be planted in drills about three feet apart, and the seeds six inches from each other in the drills, and will need to be hoed two or three times.

The main stalk, with small branching limbs, rises about four or five feet. The grain is produced in pods about two inches long. As soon as these begin to open, the method to harvest them is to gather the pods, as they open, with the hand, and lay them to dry thoroughly in the sun, when they will be fit to shell out, and to begin to use the grain. The preparation for the table is the same as that in the common coffee, $\frac{2}{3}$ Orka and $\frac{1}{3}$ common coffee may be used together to good advantage. If Orka is used alone, a greater quantity is necessary than in the use of the common coffee, and it possesses all the exhilarating and nutritious properties of the common coffee. From what I have experienced, in the cultivation of this excellent grain, it is my belief that 2000 lbs. can easily be obtained from an acre of our well cultivated prairie land; and I am in the belief it may be cultivated to good advantage in your country.

If an experiment should prove successful, you will confer a favour on your fellow-citizens by giving it publicity.

EXTRACTS FROM EVELYN'S SYLVA.

EVERY man of agricultural reading must have heard of Evelyn, the father of *English* agriculture—the great propagator of plantations of forest trees. He flourished during the civil wars—I say *flourished*, because though persecuted, and in hazard, he raised up a name, which will be immortal in *that* country, and ought to be venerated in every other. His misfortunes laid the foundation of his glory, by forcing him to philosophick studies. Historians, biographers and cultivators have united in admitting, that to *his* writings chiefly, are the English nation indebted for those fine plantations of the most valuable trees, which form at once its finest ornament—its strength—and its best riches. The civil wars had nearly destroyed their natural forests. The country was almost as destitute of fine oaks, as old Massachusetts is at this day. He created by his zeal, his eloquence, his fine philosophical spirit, a taste for planting. Many an ancient family whose finances were reduced, found themselves again restored to opulence by the provident exertions of those, whom Evelyn inspired with a passion for planting trees. Who can think of Evelyn, or Olivier de Serres, the great French cultivator, without interest? Who can contrast their achievements with those of the most successful conquerors, without feeling a decided preference for them?

We shall take as a specimen, Evelyn's reasons for preferring planting the seed, where the tree is to grow, to transplantation. "It has been, says Evelyn, stiffly controverted by some, whether it were better to raise trees for timber and the like uses from their seeds and first rudiments, or to transplant such as we find have either raised themselves from seeds, or sprung from mother roots. Now that to produce immediately of the seed is the better way, these reasons seem to evince.

"First, because they take soonest. Secondly, because they make the straightest and most uniform shoots. Thirdly, because they will neither require staking, nor watering, which

are two considerable articles, and lastly, for that all transplanting (though it much improves *fruit trees*) unless they are taken up the first year or two is a considerable impediment to the growth of *forest trees*; and though it be true that divers of those which are found in woods, especially oaklings (or young oaks) young beeches, ash, and some others spring from *self-sown* seeds, yet being for the most part dropped, and disseminated among half rotten sticks, musty leaves, and perplexities of the mother roots, they grow scraggy, and being overdripped (that is too much subject to the drippings from the trees which shade them) become squalid and apt to gather moss.

“ Which checks their growth and makes their bodies pine.”

Vir. Georgicks, Lib. II.

“ Nor can their roots expand and spread themselves as they would do, if they were sown, or had been planted in a more open, free, and ingenuous soil. And that this is so, I do *affirm upon experience*, that an acorn sown by hand in a nursery, or ground where it may be free from these incumbrances, shall in two or three years, outstrip a plant of twice that age which has either been *self-sown*, or *removed*, unless it fortune (happen) to have been scattered into a more natural, penetrable, and better qualified place; but this disproportion is yet *infinitely* more remarkable in the Pine and Walnut trees, where the nut set in the ground, does usually *overtake a tree* of ten years growth, which was planted at the same time; and this is a secret so generally misrepresented by most of those, who have treated of these sorts of trees that I could not suffer it to pass over without a *particular remark*.”

Such were the opinions of the venerable Evelyn, expressed to be sure in the quaint language of his age in the middle of the 17th century, and it is certainly no mean praise to say, that all succeeding cultivators have agreed to the truth and justice of his opinions. No policy can be so bad as that of digging up the weak and sickly plants of the forest to form the ground work of new plantations. It was not *Evelyn's idea*,

that forest trees should not be raised in *nurseries*, and thence transplanted to the plantation where they are to grow. He expressly refers to nurseries, and excepts from his interdiction of transplantation, trees of from 2 to 3 years old.

Those of us who have been employed in the work of planting forest trees, (on a scale miserably small we admit, and yet so important, that if every man in the state who owned a farm, had planted as many, we should have a rich supply of trees) very well know, how wise Evelyn was. *We* had no nurseries from which we could draw our supplies. We were obliged to resort to seedlings of the forest, but we can affirm, that we owe our success entirely to his hints. Trees of 2 or 3 years old; of two or three feet high, have far out stripped those of ten years old, and which were removed at ten feet height. Many of the latter perished or became sickly, but of the former which were so small, that we could raise and set them with our thumb and forefinger, we can shew plants of 17 years growth, which are 30 feet in height, and would almost furnish joist, and some few of them small timber for building. Nothing can be more pernicious to successful planting, than the greedy desire to have great plants at *once*. The city of Boston has always been possessed with this rage for planting great trees. and they have lost more by this course than would have made the Common a noble grove. Their trees have perished by hundreds, and we can look around and see many of our neighbours who have committed the same faults. But our object, in introducing this topic, is far more interesting. It is to shew, how much we have *promised*, and how *little* we have *effected*. One of the earliest cares of the Massachusetts Agricultural Society, was to encourage plantations of forest trees. They offered rewards for it; we believe only *two* premiums were ever claimed, and those were by Col. Robert Dodge, an Essex farmer, and by Moses Bullen, Esq. of Medfield. We should be glad to hear of the success of those experiments at this day. If 30 years since, when hard wood was sold in Boston at 2 dollars per cord, it was thought an interesting object

to encourage planting, what must it be now, when wood is worth 6 dollars per cord? The Legislature required of *all* the agricultural societies, that they should offer premiums for *new* plantations of forest trees. Has there been *one* claim for a premium since? We fear not. We want some "Evelyn" to rouse our attention to the subject. How many waste pasture grounds are there, which do not give 2 per cent on their value, which might be made in 15 or 20 years to produce double their present value by timber? Land within 30 miles of Boston, valuable only as pasture is now worth only from 10 to 15 dollars per acre, and in 20 years if well and judiciously planted, the *wood alone* would produce from 30 to 40 dollars. Let our farmers think on this subject.

THE STATE OF THE SEASON.

[From the Daily Advertiser.]

MR. HALE—I have for so many years given some account of the progress of vegetation, that I find my friends, in town and country, look for it. It is perhaps of as much use as diaries of the weather and common thermometrical statements. In some short remarks, which I sent you early in this month, I observed, that though the season was exactly one month behind the last, in the beginning of April, yet like the Siberian summer, it had advanced so rapidly, that on the first of May, it had caught even the precocity of the last season. After that communication, long continued cold easterly and northerly winds set in. On the 6th of May ice was made in the country, sufficient to bear a child of 10 years of age, and all the appearances of the progress of vegetation ceased. The buds half started from their winter protection, remained for fourteen days nearly quiescent—yet the season has advanced within a few days, and has acquired an average

rate of forwardness. Rains have been most abundant—springs which had been deficient for two years are amply supplied—the grass is well set, and the season promises abundantly as to all the fruits except apples. The shew of pear blossoms never was exceeded—the country is literally white with them. The applies will of course be less numerous, owing to the extraordinary efforts of the trees, last year—yet there will be an ample quantity, and while less loss will be sustained by the cultivator, the consumer will feel no failure in the supply. If apples may be a little dearer, the more important article of hay will probably be cheaper. It will be impracticable to give a schedule of the progress of the various seasons without repetition—yet few persons preserve the statements of former years, and it is not possible to give a correct view without comparing *many years*. This will enable the curious to make useful remarks—and it will convince all, that however different the weather, and the progress of vegetation, we have a superintending Providence above us all, who regulates *all seasons in mercy*, and compensates by the heat, or moisture at *one moment*, all that may be deficient in *another*.

The statements are made from the same tree or plant—in the same exposure, and situation, and therefore not liable to the variations, which would appear from transient observations of passengers, or travellers.

The Cherry—its first opening,

In 1813,	May 10	In 1815,	May 10
In 1816,	May 6*	In 1817,	May 6
In 1818,	May 17	In 1819,	May 6
In 1820,	May 2	In 1821,	May 9
In 1822,	May 1	In 1823,	May 7

The Pear—its first opening,

In 1813,†	May 20	In 1815,	May 20
In 1816,‡	May 12	In 1817,	May 7

* This was the most disastrously cold year afterwards.

† Cherries opened this year on the 10th of May, but cold winds kept back the pears to the 20th.

‡ This was an exceedingly cold season afterwards.

In 1818,*	May 24	In 1819,	May 17
In 1820,	May 9	In 1821,	May 13
In 1822,	May 4	In 1823,	May 13

The Apple—its first opening,

In 1813,	May 23	In 1815,	May 25
In 1816,	May 18	In 1817,	May 12
In 1818,	May 25	In 1819,	May 19
In 1820,	May 11	In 1821,	May 13
In 1822,	May 9	In 1823,	May 19

I will add the Lilac the ornament of our Election day.

In 1817,	May 19	In 1818,	May 27
In 1819,	May 25	In 1820,	May 20
In 1821,	May 20	In 1822,	May 12
In 1823,	May 22		

Thus it will be seen, that the present season is about an average one in point of forwardness, while it is far above the average in its verdure and promise.

N. B.—There is some danger, that seeds of squashes and other tender plants committed to the ground early in May, have rotted and will require re-planting. It is, we know, the fact in some places.

A ROXBURY FARMER.

Roxbury, May 22, 1823.



THE MODE OF MAKING CIDER ADOPTED BY THE RELIGIOUS SOCIETY AT CANTERBURY, NEW-HAMPSHIRE, COMMONLY CALLED SHAKERS.

[It is with great pleasure we insert this article, not only on account of its intrinsic merits, which are great, it having all the clearness, precision, and simplicity which you would expect from men so well skilled, and who make the best cider (it is said) in New-England, and who, in every thing they

* This season deserves notice, for though so late it was a fine one.

undertake are eminently successful ; but because it gives us an opportunity of speaking of the admirable example set by this description of persons in all that relates to agriculture, horticulture, and manufactures. With their peculiar tenets and ceremonies, an agricultural work has no concern ; but it is its province to recommend excellent examples of neatness in *cultivation*, and in care, and caution, and fidelity in manufacturing articles important to the farmer. It will not be questioned, that the Shakers have set a most praise-worthy example—not of industry, sobriety, and neatness *merely*, but of exactitude. They undertake nothing in which they do not succeed better than their neighbours ; and the secret of their success will be found to consist in their system of order, and the thorough and effectual manner in which every thing is performed. It is highly probable, that this sect (should it continue to maintain its ground) will finally furnish the states in which they live, with the best and purest seeds, with the neatest and most faithfully manufactured implements. We hope, that other sects of christians will shew, that there is nothing peculiar in the opinions of the Shakers, which should produce of necessity these happy and honourable results, but that they will all strive to “have every thing performed decently and in order.” We hope to be able to reply to the queries of the Shakers, as to the manufacture of woad, or rather its preparation from the leaf, for the immediate use of the dyer. They will be pleased with the letters on that subject, of Gen. Dearborn and Mr. Crowninshield.]—ED.

To John Prince, Esq. Treasurer of the Massachusetts Agricultural Society. Canterbury, March 24, 1823.

MUCH RESPECTED FRIEND PRINCE,

I RECENTLY received your very liberal and worthy favour of the 22d ult. for which I feel a grateful acknowledgment, and hope to make you some compensation whenever you call on us again. We were very glad to hear of your safe return home.

You left with us one agricultural No. viz. No. 3, vol. 7, I fear through mistake, which (if so) we will rectify at our next interview.

The Agricultural Numbers which we now have, including those you sent us, are the following : viz. Nos. 2, 3, and 4, of vol. 3, and Nos. 1, 2, 3, and 4, of vol. 4, and No. 2, of vol. 5, and Nos. 2, 3, and 4, of vol. 6, and Nos. 2 and 3, of vol. 7.

The No. containing Gen. Dearborn's letter on woad, we have had ; but our clothier having cultivated this plant the last season with success, is now in quest of information how to manufacture and prepare it for use. He has respect to a treatise to which the General's letter refers.

As to experiments and improvements to communicate to the Agricultural Society, be assured we feel much indebted to you, and also to Esq. John L. Sullivan, for your liberality, and should be willing to communicate any thing in our power, that would be beneficial to mankind ; but as our minds are not so intent on natural and external things as on an interest in Christ, and as our agricultural pursuits and improvements are so small and simple, we consider ourselves inadequate to say much on that subject.

However, there are two or three small improvements we shall mention for your consideration, having been under our experience for some years ; and which we find to be beneficial to us, and from which, if you and others can derive the same benefit, we shall feel ourselves amply rewarded for giving the following hints.

1st. The process in making and refining cider in order to have it good and wholesome, is so simple, (though important) that many people entirely overlook it, supposing the mystery so deep, as to be entirely out of their reach : and others, perhaps, tenacious of the customs of their forefathers, shut their eyes and ears to any improvement, however propitious to their interest and comfort ; such will probably be contented to smack over their ill-flavoured and unwholesome beverage through life.

Now, friend Prince, if we should explain what we know respecting the management of cider, some people would laugh, and say they did that and a great deal more : and I suspect they do, and add many more ingredients, such as water, pomace, and rotten fruit ; and perhaps something more from fowls, beasts, and vermin, none of which makes the cider any better.

We shall not hesitate to give it as our decided opinion, that cool climates are much more favourable to cider than warm. However, what greatly contributes to the goodness and delicacy of cider, is the cleanliness of the casks which contain it. In fine, all utensils used in making cider, should be kept clean, and not suffered to get sour through the whole process ; even the press should be frequently rinsed down, during the time of making cider, to prevent sourness or a change in the cider.

To clean casks which have been used for cider, we take them from the cellar as soon as convenient after the cider is out, (reserving the lees for stilling) and rinse each clean, first with a pailfull of scalding water, then with cold, leaving the casks with the bungs down for a day or two, or till dry. Then we bung them tight, and return them to the cellar, or some convenient place (not too dry) for their reception. Previous to filling these casks with cider the ensuing season, we scald and rinse them again, as above. Foul musty casks ought to be committed to the fire. Hogsheads or large casks are the best for cider, especially those that have recently been used for rum or other spirit.

Apples that drop early we make into cider for stilling, it being unfit for table use ; the spirit of which, together with that of the lees, we return back to our store cider at the time of racking, which is generally about the first of January. Cider made of apples before they are fully ripe, we deem unfit for drinking : and even when ripe, if they are made into cider during warm weather so as to produce a sudden and rapid fermentation, the cider will unavoidably be hard and un-

pleasant. The fact is, the slower cider is in fermenting, the better it will be at any age : consequently the later in the season it is made, and the cooler the weather (if the business can be conveniently performed) the better ; especially for long keeping. However, this is a cold work for the fingers, unless pressed in a rack, which is the best method.

About the first of November we think a suitable season, if the weather be dry, to gather and put under cover apples for store cider. After lying in this situation till mellow, (not rotten) we commence grinding.

Doubtless good cider for early use, or perhaps for the first year's drinking, may be made previous to this time ; but cool serene weather should be chosen for the business.

The grinding trough should be spacious enough to contain a cheese, in order to admit the pomace (if the weather be cool) to lie over one night before pressing. This method contributes much, both to the colour and quantity of the cider.

In the morning press it out gradually, and put it up into the casks through straw, or rather a coarse sieve, fitted and placed within the tunnel : after which, we convey it immediately to a cool cellar, leaving out the bungs till the fermentation chiefly subsides, which may be ascertained by the froth settling back at the bung-hole. We then drive in the bungs tight, leaving a small spigot vent a while longer, if need require, to check the pressure, which must finally be made air tight.

About the first of January, we rack it off free from the lees into clean casks. Those that have been recently used for spirit are to be preferred. But otherwise ; having drawn off one cask, we turn out the lees, scald and rinse the cask as above ; add three or four pails full of cider ; then burn in the cask, a match of brimstone attached by a hook, to the end of a large wire fixed in the small end of a long tapering bung fitting any hole. When the match is burnt out, take off the remnant ; apply the bung again, and shake the cask in order

to impregnate the cider with the fume. Add more cider and burn another match. Then add from one to three gallons of spirit (obtained from the lees as above) to one hogshead; fill up the cask with cider, and bung it down air tight, and let it remain till it becomes of mature age.

Cider managed in this way will keep pleasant for years. We would not be understood to suggest a notion, that good cider cannot be obtained without the addition of spirit; especially for immediate use, or the first year's drinking; but the contrary. Yet spirit will give it a new and vigorous body, and insure its preservation.

To make matches for stumming casks, take strips of linen or cotton rags about 1 1-2 inch wide, and 3 or 4 inches long, dip the end of each in melted brimstone, to the extent of one inch.

2d. Another improvement, though very simple, we shall recommend, as having been highly beneficial to us for some years; that is, the preservation of vines, and other plants, from the depredations of bugs and insects, by means of wooden boxes. These boxes are made of thin boards, about one foot square, and 4 or 5 inches deep; covered with thin, loose-woven cloth, either of cotton, hemp, or linen, quite as thin as a coarse meal sieve. The cloth should be oiled over with linseed oil. The boxes are placed and kept over the hills till the vines become of sufficient growth and strength to bid defiance to the depredations of those devouring insects. This is the cheapest, best, and finally the only effectual method that we have ever found to preserve our vines from destruction.

These boxes with careful usage will probably last for the term of 15 or 20 years. They should be put under cover when they are not in use; and it would be well to repeat the oiling of the cloth tops once in 4 or 5 years with train oil.

3d. Another thing having been under our experience for many years, we find to be very beneficial to us in our joint situation; that is, it saves considerable manual strength and

hard labour, viz. the taking off hay from the load and placing it on the mow by a horse, with what we call grabs or hooks, fixed to a tackle, which is suspended to the ridge pole or rafter of the barn, nearly over the centre of the mow ; and to the rope of which (passing under a truck) a horse is hitched and ridden by a small boy directly forward through the yard. We frequently take off a ton of hay at four or five draughts, each of which being suspended by a rope, is, by two hands easily swung, as the rope slacks, to any part of the mow. The rope is held by the loadman, while the horse turns about and commences his trip towards the load. However, we could not recommend this method to farmers who cut hay on a small scale, or where but few hands are employed.

At any rate, we should rather prefer the location of a barn (when practicable) on the side of an hill, so as to facilitate a passage over a floor across the beams. This method we have proved, and find it an excellent plan. I presume one man in this situation, will get off more hay in the same time, and with less fatigue, than four would in the ordinary way.

4th. And lastly ; we have a machine (moved by water) for thrashing and cleaning grain ; which we can, with confidence, recommend to great farmers. This machine will thrash and winnow unusually clean, at least 100 bushels per day : it has done 16 bushels per hour. Thus it not only saves much time and hard labour, but also enables us to secure our grain from vermin and other waste, immediately after harvesting. Although (as we understand) some sagacious speculator has copied a model, or nearly a model, from our machine, and obtained a patent for the same, as having been his own invention ; yet we think we are fully able to prove our right of claim to the invention, it being the result of our own mental researches.

We never saw nor heard of any thing similar, previous to our building the above mentioned machine for our own use, in the summer of the year 1819 ; to the benefit of which, we make you and every other man freely welcome, having never in-

tended to make other people tributary to our avarice, by securing a patent for this, or any thing else, that might be of service to mankind. However, as we have not room here to give a plan, nor even a minute description of this machine, you will please to call and see it the first opportunity, and judge for yourself of its utility.

Although water may justly be considered by far the best power of motion, yet I presume this machine may be so constructed as to operate by horses. The cost, exclusive of a building to contain the grain, is probably about \$100.

I am, with due respect, your friend,

FRANCIS WANKLEY.

P. S. One of your former numbers speaks much in favour of fiorin grass; if you think it to be profitable, we should like to procure some means for propagating it; also a small paper of Mangel Wurtzel seed.

REFLECTIONS ON THE IMPORTANCE OF STEEPING SEEDS IN VARIOUS FRUCTIFYING LIQUIDS, WHICH HAS BEEN THE SUBJECT OF MUCH DISCUSSION.

[Editors.]

MEN have been always prone to devise, and adopt some ready and mysterious way of hastening perfection in *all* the arts. There is no one of them, that has not at times boasted its philosopher's stone—some expeditious mode of dispensing with what Providence has made indispensable to the attainment of all good in this world, viz. constant, unremitting, intelligent exertion. However futile and ridiculous these endeavours may have been in *other* arts and sciences, (and they are in this age of true philosophy regarded, as they ought always to have been, as the chimeras of enthusiasts,) in the art or science of agriculture, they are eminently

preposterous and absurd. There is in this art, no easy and compendious road to success. The faithful division of the soil by repeated and incessant labour, the application of proper manures or composts to enrich it; to impart to each particular species of soil, the elements in which it is found to be deficient—these are the great secrets, and the only secrets, of successful cultivation. While we were young proficients in this science, we read with wonder, not unmixed with incredulity, the surprising effects of steeping seeds in various liquors, impregnated with substances, which a vain philosophy always more satisfied with novelty than with truth, had decided to be the best food for plants. As we have grown older, we have found, that the most rational physiologists are not yet agreed as to what is the proper food of plants. They have contented themselves with simple facts, that some plants prefer one species of soil or manure, and others prefer a very different one. And they have endeavoured, as far as possible, to give to each plant the kind of soil and manure in which, and by which, it is found to flourish best.

The supposition, that so small a seed as that of wheat, or Indian corn can imbibe from being steeped for twenty-four hours in any liquor, however fructifying or favourable, a degree of force, which can enable it to withstand the effects of an uncongenial soil, or to produce more abundantly even in a congenial one, savours too strongly of mystery to be readily adopted by any rational mind. We are not disposed to deny any influence whatever to such experiments; but we think it must be very limited, and that it has been grossly over estimated. It would be indeed strange, if there were not some quackery in this art, as in all others, and while we have at least one hundred medicines, which will cure every disease to which man is subject, (though no visible diminution of disease has been as yet produced by any or all of them,) agriculture should not also have its universal panacea, competent to eradicate all disease, and to produce the highest

possible state of vegetable health. It is with no small pleasure, that we are able to state, that Evelyn, the Bacon of philosophical agriculture, had a thorough disbelief in this short hand mode of producing luxuriant and prolific vegetation. In speaking of the soils in which forest trees flourish, he gives this sly rebuke to the believers in fructifying steeps. "Rather, therefore, we would take notice how many great wits and ingenious persons, who have leisure and faculty, are in pain for the improvement of their heaths and barren hills, cold and starving places, which causes them to be despaired of and neglected, whilst they flatter *their hopes* and *vain expectations* with *fructifying liquors*; *chymical menstruums*, and *such vast conceptions*—at the same time, that *one may shew them* as heathy and hopeless grounds and barren hills *as any in England*, that do now bear, or lately have borne, woods, groves, and copses which yield the owner more wealth than the richest and most opulent wheat lands."

There is a strong vein of sarcasm and truth in these remarks, and they had their effect in covering England with valuable and beautiful forests and groves, as we now find it. It may be of some practical use to add the experience of the writer of this article. He planted *some hills* which consisted entirely of sand or gravel, and which would not furnish vegetables for the support of a single cow for six weeks in a year. It was represented to him by his neighbours that trees would not grow upon them. It seemed, indeed, to be a hopeless undertaking. Still he persevered, and the wood now growing at the end of fifteen years would pay, if cut down and sold to the bakers, for a sum equal to the price of the land; he believes, to double that price. But the most important remarks on this subject were made in a note by the editor of Evelyn's *Sylva*, Alexander Hunter, the author of the "Georgical Essays," a man of rare merit, philanthropy, and good sense. He goes at large into the question of the value and importance of *steeping seeds*, placing the question, as we believe, on its true and rational ground.

“The steeping of seeds,” he remarks, “in prolifick liquors, is not of modern invention. The Romans, who were good husbandmen, have left us several receipts for steeping grain, in order to increase the powers of vegetation. In England, France, Italy, and in all countries where agriculture is attended to, we see a variety of liquors recommended for the same purpose. Good nourishment has ever been observed to add strength and vigour to all vegetables. Hence it was natural to suppose, that by filling the vessels of the grain with nourishing liquors, the germ with its roots would be invigorated. *How far this is founded on just principles remains now to be examined.* For my part,” says Mr. Hunter, “I am not an advocate for steeps. All my experiments demonstrate that they have no inherent virtue. I have more than once sown the same seed, steeped, and unsteeped, and though all other circumstances were minutely alike, yet I could never observe the least difference in the growth of the crops. *I confess that when the light seeds are skimmed off, as in the operation of brining, (or steeping in water saturated with salt, which is heavier than common water) the crop will be improved and diseases prevented, but these advantages proceed from the goodness of the grain sown, and not from any prolifick virtue of the steep.* I am happy in not being singular in my objection to steeps. Many philosophical farmers have been induced to quit their prejudices, and are now convinced, from their own trials, that there is no dependence on prolifick liquors, though ever so well recommended. Some people have been hardy enough to persuade themselves, that the *tillering* of wheat, (its disposition to spread and send up many shoots from a single kernel) may be so much increased by invigorating the grain (by steeps) that only one half of the seed will be required. Duhamel, one of the most accurate of experimental husbandmen, and a most excellent philosopher, speaks in the strongest terms against the practice of steeping, *so far as it supposes an impregnation of vegetative particles.* I shall not

here repeat his experiments. I shall only observe, that they are such as any farmer may make ; they are *plain and conclusive*. Good seed, when sown upon land in good tilth, will always produce a plentiful crop. The best grain impregnated to the full with the most approved steep and sown upon land indifferently prepared, will forever disappoint the hopes of the farmer. I do not presume to condemn the practice in positive terms because my own experiments are against it. Other experiments may be opposed to mine. I shall therefore, rest the whole upon a description of what happens to grain, after it has been committed to the earth. The subject is curious, and the discussion of it not very difficult. A grain of wheat contains within two capsules, a considerable share of flour, which, when melted down by the watery juices of the earth, constitutes the nourishment of the tender plant, *until its roots* are grown sufficiently large to absorb *their own food*. Here is evidently a store-house of nutriment, and of course the plumpest grains are the most eligible for seed. From repeated experiments, I am convinced that the plumpest seeds are always preferable to the small ones. I have sprouted every kind of grain in a variety of steeps, and *can assure the farmer* that the root and germ never appeared so vigorous as when sprouted in simple *elementary water*—an argument that the seed requires no assistance. The *same steep* when applied in *quantity* to the soil will undoubtedly invigorate the roots, and nourish the plant ; but in that case it operates like other manures, and loses the idea of a steep. As nitre, and sea-salt, and lime, are generally added to steeps, I have *constantly observed* that their application rendered the radicle and germ sickly and yellow—a plain proof, that they were unnaturally used at that season. Did the farina of the seed need any additional particles, it might be supposed that broth made of the flesh of animals would be most agreeable. [Probably founded on the fact that animal manure is the most powerful. *Editors.*]

“ To be satisfied of that, I sprouted some grains in beef

broth, and an equal number in simple water. They were afterwards sown, but I could perceive no difference in the crop. As no invigorating, or fructifying liquor had ever stood the test of fair experiment, we may venture to lay it down as an *established truth*, that plump seed, clear of weeds, and land well prepared to receive it, will seldom disappoint the hopes of the farmer."

We are not prepared to express a decided opinion in favour of Mr. Hunter's suggestions, though they derive great weight from the support of two such men as Duhamel and Evelyn.

There is one consideration which Mr. Hunter has certainly not pressed as far as he might have done. The *bulk of the seed* is so extremely small compared with the roots and top of any plant, (Indian corn, for example, whose root and tops probably contain from 200 to 500 times as much matter as the seed,) that it is incredible, that any productive virtue (be it ever so great) could materially affect the growth of a plant, which daily requires so much food. We thought the article ingenious, and we give it the preference, because it is in opposition to long a established opinion, founded in mystery.

ON RAISING THE OAK FROM THE ACORN, AND THE BEST
MODE OF DOING IT.

[By the Editors.]

IT is very extraordinary, that, notwithstanding the Massachusetts Agricultural Society has for thirty years offered great premiums for the culture of the oak in plantations, and especially since the legislature enjoined it upon the several agricultural societies throughout the state to offer premiums for the raising of forest trees, but two claims should have been made. We can only account for it on one of the following grounds, either that the premium has not attracted the atten-

tion of our farmers, or that they have not sufficient spirit and enterprise, or that they are averse from any new culture, however important and reasonable. We shall take the article of White Oaks, which were selected by our society, as being the most valuable timber of the Northern States.

The premium offered in 1822, for one acre planted with white oaks, and found to be in the best state in September 1823, (that is at eighteen months old.) was 100 dollars per acre. The average price of good land throughout the state does not exceed twenty dollars per acre. The expense of raising seedlings of eighteen months old would not exceed twenty dollars more, if the following account be correct; indeed we believe it would not exceed ten dollars, as we can see no reason why the expense of planting an acre of acorns should exceed the expense of planting an acre of corn. There would be left then of clear profit to the raiser of an acre of oaks a profit of sixty dollars at least for two years culture, and as is remarked in the following article, a crop of grain may be raised at the same time sufficient to pay the whole expense. Have we no man in the state who is spirited enough to set the example, and carry away the honour and profit? The acre of oaks will *afterwards be his*, and there is no mode in which he could employ his land to so great advantage. It will not surely be said, that our farmers *cannot spare any of their land*, when our great error consists in holding more than we can, or do cultivate *well*.

On the mode of raising the oak "from Hunter's Notes on Evelyn's Sylva."

"HAVING the ground properly prepared, (by breaking it up and reducing it to a fine tilth, either by potatoes or repeated ploughings) and having a sufficient quantity of acorns, all gathered from the most vigorous, healthy, and thriving trees, proceed to the setting them in the following manner. In the month of February or March [but in this country we say *from experience*, the months of November or

December if the latter month be open) let lines be drawn across the ground for the rows, at the distance of four feet from each other; but if this be thought too great an interval, the rows may be made three feet, in which case the acorns must be put down at a greater distance from each other. Then having sticks properly rounded to make the holes, (a common dibble) plant the acorns in the rows at ten inches asunder. Let them be put down about two inches below the surface, and see that the earth be properly closed upon them to prevent mice or crows from injuring the seed. In some places it is customary to sow the acorns after the plough in furrows, but where the ground happens to be stiff, great care should be taken not to cover the seed with too thick a furrow.

“The first year after planting the acorns, the weeds must be kept down by hoeing and hand-weeding, and this must be done early in the spring before the weeds get so strong as to hide the tender plants, which would occasion many of them to be destroyed in cleaning. It is also the cheapest, as well as neatest husbandry, to take weeds down, before they grow too large; for though the ground may require an additional hoeing in spring, yet the weeds being hoed down when young, a man may hoe over a great quantity of ground in a day. Weeds cut in their tender state immediately die. Whereas, when they are old and strong, they frequently grow again, especially if rain falls soon after, they perfect their seeds in a short time, and thereby injure the whole plantation.

“The second year of their growth the common plough may be made use of, to cultivate and keep the ground clean, [or potatoes might be raised between the rows if proper care be taken not to trample on the plants. Editors.]

As these acorns sometimes fail, the author proposes a nursery in the same field to supply the deficiencies.

“Having then given directions for the raising of wood, I proceed,” says the author, “to their future management.

And first, the rows being four feet asunder, and the plants two feet apart in the rows, they may stand in this manner for twelve or fourteen years, when every second plant may be taken out and sold for hoops or poles. After every second plant is taken away, let the roots of those taken away be grabbed up to give the remaining plants more room freely to extend their roots. The plants being now four feet apart each way, they will require no more thinning for seven or eight years, that is, till they are twenty years old, when the healthiest and most thriving trees must be marked to stand for timber, and the others cut down for poles, and their roots left to produce future underwood.

“The oak will grow and thrive on almost any soil, if properly planted, though it cannot be supposed that their success will be equal in all places. A rich, deep, loamy soil is what oaks most delight in, though they will grow exceedingly well in clays of all kinds, and in *sandy soils, in which last, the finest grained timber is produced.*”

The author then proceeds to inquire, which of the different modes of raising oaks produces the best timber, from the acorn, the seed-bed, or the nursery. Mr. Evelyn decides in favour of *planting the acorn*, and Mr. Hunter adds, that whoever will look at the woods which were *sown*, and compare them with those which were *planted from nurseries*, will not hesitate a moment to declare in favour of Evelyn’s opinion.

What are the obstacles to our following this excellent example of the great farmers of England, in the age, in which our ancestors emigrated? Is it because we are too impatient, and unwilling to await so tardy a return? Yet there are constant pleasures in the annual growth of our forests, they seem to be the work of our own hands, at least of our own providence and care; they are subject to fewer hazards, and their profit is certainly greater than that of any other employment of capital on land, or is this aversion to planting the effect of an hereditary prejudice against trees?

Our ancestors found *their extirpation*, their *greatest labour* and do we continue to feel their prejudice, when woodland is far the most valuable, and must constantly increase in its comparative value?



PROFESSOR COGSWELL'S DONATION OF A VALUABLE HERBARIUM TO THE VISITORS OF THE MASSACHUSETTS PROFESSORSHIP OF NATURAL HISTORY.

IT is not, perhaps, generally known, that the Trustees of the Massachusetts Society for *promoting agriculture*, are also, with the President of the American Academy of Arts and Sciences, the President of Harvard University, and the President of the Massachusetts Medical Society, the Visitors of the Massachusetts Professorship of Natural History, and, of course, of the Botanick Garden.

Every thing interesting to *that establishment* ought, therefore, to find a conspicuous place in *this journal*.

It is not necessary at this day, to urge the importance of botanical knowledge, and its necessary connexion with agriculture. The liberal exertions of the government of the United States under the administrations of Jefferson, Madison, and Monroe, to promote the knowledge of the vegetable productions of the extensive countries over which we claim jurisdiction; their employment of scientifick men to explore these regions with views to the promotion of the science of natural history; the honourable progress made in that science, which was scarcely known in the United States 40 years since, by the successive labours of Cutler, Mohlenberg, Peck, Cleaveland, Elliot, Silliman, Say, Bigelow, Nuttall, Torrey, and many others, render any remarks in its favour unnecessary and inexpedient.

We may, however, assume some praise for Massachusetts, for its exertions, both public and private, in founding a bo-

tanick school ; and what is a rare praise in the United States, in *preserving* what it *had* founded. The Botanick Garden at Cambridge, is the only surviving one in the United States. The opulent and extensive and liberal State of New-York, after paying \$80,000 for Dr. Hosack's garden, is said to have suffered it to pass into decay, while Massachusetts, without any extensive grant, has by a moderate annual encouragement, wisely fostered an institution nobly endowed by private benefactions. We trust the rulers of the State, seeing the interest taken in this science, will now *do more* ; and as a State of the first importance, place the garden at Cambridge, on a footing at least with that at Liverpool, created and sustained by a single city of Great-Britain.

Professor Cogswell is entitled to great praise for the devotion of his time, his thoughts, and his property, while abroad, to the acquisition of the means of advancing the science of natural history in his native country. Had he *retained* for his own use, his valuable collections, he would still have been a benefactor ; for every citizen who collects a library or a cabinet of minerals, or a herbarium, renders essential services to his country, but when he presents these fruits of his zeal and exertions to the publick, they are still more his debtors, and the least they can do, is publicly to acknowledge their sense of obligation. In this case, I personally know, that the object of our notice would gladly have been spared this public tribute ; but private delicacy must yield to public duty, and superior public interests.

J. L.

Cambridge, April 12, 1823.

Dear Sir,—When I was in Switzerland, I procured a large Herbarium of the plants of that country, which I look upon as too valuable to be shnt up in the private cabinet of an individual, especially of an individual, whose other occupations afford him but little time for the study of Botany. I have determined, therefore, to present it to the Massachusetts Professorship of Natural History, believing that it will there be

in better hands than in any other in the country. I must beg you to offer it to the Visitors of the Professorship in my name. It contains 3172 specimens of dried plants of central Europe, all of which, I believe, are in perfect preservation; of these, 555 are Lichens still attached to the substances on which they grew. The Herbarium is put up in volumes like that, which accompanies this note, of which there are twelve, beside a distinct one for the Cereales. The Lichens are in a cabinet by themselves, in a different form. The plants were collected partly by myself, and partly by Mr. Sevinge, of Bern, who pressed and prepared the whole. This gentleman is constantly employed by Mr. De Candolle, for this purpose, and consequently must be capable and accurate. The Herbarium was examined by Mr. De Candolle, and many of the plants verified by him; he considered it very perfect of its kind. Dr. Bigelow examined it also, and was of the same opinion; and so was Mr. Nuttall, as far as he could judge on a slight inspection. It is arranged according to the natural order, and the catalogue is made to correspond. I send a volume of the Herbarium and the catalogue, that the gentlemen may see the state in which it is, and its extent. Should the Board of Visitors do me the honor to accept this Herbarium, you will please inform me into whose hands I shall deliver it.

With great respect, I am my dear sir,
Your friend and servant,

JOS. G. COGSWELL.

BENJ. GUILD, Esq. *Secretary of the Board of Visitors of
Mass. Prof. Nat. Hist.*

The Visitors accepted this donation, and presented to Mr. Cogswell their thanks in behalf of the publick.

ON MILDEW.

THERE is no evil to which the farmer of the Northern States is subject more injurious than mildew—none, which he is more interested in seeing overcome. It is that principally which prevents his raising his own wheat, and as the first step, towards discovering a remedy, is the ascertainment of the cause of the evil, and its nature, the farmer is of course interested in learning what mildew proceeds from, and what it is. Much mystery has hung over this question, and opposite opinions have been entertained respecting it, but we trust that philosophical, and indeed all reading farmers will be pleased by perusing the following article from the pen of the well known, and respected Mr. Knight, of whom we have spoken before.

On the prevention of Mildew in particular cases. By Thomas Andrew Knight, Esq. F. R. S. &c. &c. President of the London Horticultural Society, read in 1813 and printed in 1818.

“The little pamphlet upon the rust, or mildew of wheat, for which the publick are indebted to the patriotick exertions of the venerable president of the Royal Society (the late Sir Joseph Banks) affords much evidence in proof, that this disease originates in a minute species of parasitical fungus, which is propagated, like other plants, by seeds, and the evidence adduced would, I think, be sufficient to remove every doubt on the subject, were the means ascertained, by which the seeds of this species of fungus are conveyed from the wheat plants of one season to those of the succeeding year. This, however, has not yet been done; and therefore *some persons* still retain an opinion that the *Mildew* of wheat consists only of preter-natural processes, which spring from a *diseased action of the power of life in the plants themselves.*

“An hypothesis, which differs little from this, has been pub-

lished in the present year* respecting the dry rot, or *Boletus lacrymans*, of Timber. It is contended that the different kinds of fungus, which appear upon decaying timber of different species, are produced by the remaining powers of life in the sap of the unseasoned wood; and that the same kind of living organizable matter, which, whilst its powers remained perfect, would have generated an oak branch, will, when debilitated give existence to a species of fungus. But if this power exists, and becomes capable, during its rapid declension of deviating so widely from its original mode of action, the species of fungus it would produce, might be expected to become successively more feeble and diminutive: whereas the most robust and gigantic of the whole genus, the *Boletus squamosus* springs from wood, when that is in the *last* stage of decay, and the best known, and the most valuable species to mankind, of this tribe of plants, the common mushroom [from which catchup is made, and which in Europe is a luxury of the table] appears as obviously to spring from horse dung under favourable circumstances, as any species of the same tribe appears to spring from decomposing wood, without the presence of seeds.† Yet it can scarcely be contended, that any vital power, capable of arranging the delicate organization of a mushroom, can exist in *horse dung*; and the admission of such power would surely lead to the most extravagant conclusions. For if a mass of horse dung can generate a mushroom, it can scarcely be denied that a mass of animal matter, an old cheese, may generate a mite, and if the organs of a mite can thus be formed, there could be little difficulty in believing that a larger mass of decomposing matter would generate an *Elephant* or a *man*.

“The hypothesis, therefore, which supposes the various

* Quarterly Review.

† Mr. Knight refers here to the small and large mushroom, which are found growing out of decaying timber, and are known by botanists by the names of *Boletus lacrymans*, and *Boletus squamosus*. All persons of any observation must have perceived these mushrooms on decaying timber. *Editors*.

species of fungus to spring from seeds, appears to me much the less objectionable; and, if the minute bodies, which are supposed to be the seeds, be really such, it will not be difficult to shew that these are sufficiently numerous to account, to a great extent for the ubiquity [the universal presence] of the plants they are supposed to produce, particularly as such apparent seeds, owing to their excessive lightness, are capable of being dispersed every where by winds.

“A few years ago I raised some mushrooms under glass with the intention of collecting, and subsequently raising from the seeds they might produce; and I then endeavoured to ascertain the number which would be afforded by a single fructification; for a mushroom appears to be nothing more than a fructification of the plant, though it is generally spoken of as the plant itself. I placed thin plates of talc, [isinglas vulgarly called with us] under a very large mushroom, at the period when the minute globular bodies which are supposed to be the seeds, first began to be disengaged from its gills; and I endeavoured to count the number which fell during each successive hour, within the narrow field of a very powerful lens. The labour to my eyes was, however, so severe, that I was unable to count with any considerable degree of accuracy; but the number which fell from a *single* mushroom, within the succeeding ninety-six hours, exceeded upon the lowest calculation that I could make, *two hundred and fifty millions*. I endeavoured to raise mushrooms from these seeds, but I failed to obtain any decisive results; for though I readily procured mushroom spawn by mixing such seeds with unfermented horse dung, I also obtained them in equal abundance in some instances where I had not introduced any seeds.

“Immense as the number of seeds produced by a single mushroom appears, it probably is not much greater than that which a single plant of mildewed wheat would afford; and, according to this calculation, a single acre of mildewed wheat would afford seeds sufficient to communicate disease to every

acre of wheat in the British empire, under circumstances favourable to the growth of the fungus; [Mr. Knight proceeds throughout on the belief of the doctrine advanced by Sir Joseph Banks, that the mildew is a plant of the class which botanists call fungus] and I have never seen a *single* acre of wheat since the publication of Sir Joseph Banks's pamphlet so free from *mildew*, but that it would have afforded seeds enough amply to supply the adjoining hundred acres. There is also reason to believe that the barberry tree (or shrub) communicates this disease to wheat, and I have also observed a similar, apparent parasitical plant on the couch grass, in the hedges of corn fields.*

“Neither the *mildew* of *wheat* nor any other kind, can however, I think, be communicated directly from the leaves and stems of one plant to those of another; very numerous attempts made by myself to succeed in experiments of this kind, having, I believe, proved abortive; though I once fancied that I had succeeded in two or three instances. I am, therefore, much inclined to believe that the parasitical fungus, which occasions every disease of this kind, enters the plant in the first instance *by the roots*, though it may probably be transferred by the graft, and probably by the bud, from one *fruit tree* to another; and if the seeds be capable like those of many other plants, of remaining sound a considerable time beneath the soil, or in other situations, till circumstances, which are favourable to their growth, occur, the abundant appearances of mildew, or mushrooms, may

* We witnessed three years since the most unequivocal proofs of the effects of the barberry on surrounding plants of winter rye. Several days before the mildew was seen on *any other* parts of the field, it appeared in extensive and destructive influence around a barberry bush. We called the attention of Dr. Bigelow to the fact, which could not be questioned. There was, however, some doubts on his mind whether the fungus on one and the other was identically the same. But the fact cannot be questioned, that it first appeared in the vicinity of the barberry, and thence gradually and rapidly spread in diverging lines over the whole field. The barberry is constantly affected with this disease, and at an early season before it blossoms. *Editors.*

be accounted for without supposing them to be generated wholly by the bodies from which they spring.

“ I shall not trespass on the time of the Horticultural Society by dwelling longer upon the primary causes of the various diseases, which are comprehended under the name of mildew; but shall proceed to the immediate object of the present memoir, which is to point out the means by which the injurious effects of the common white mildew may be in particular cases, prevented.

“ The secondary, and immediate causes of this disease have long appeared to me to be the *want* of a sufficient supply of moisture from the soil, with *excess* of humidity in the air, particularly if the plants be exposed to a temperature below that to which they have been accustomed. If damp and cold weather in July succeed that which is warm and bright, without sufficient rain to moisten the ground to some depth, the wheat crop is generally injured by mildew. I suspect, that in such cases, an injurious absorption of moisture by the leaves and stems of the wheat plants takes place; and I have proved, that under similar circumstance much water will be absorbed by the leaves of trees, and carried *downwards through their alburnous substance*; though it is certainly through *this substance* that the sap *rises* under other circumstances. If a branch be taken from a tree when its leaves are mature, and *one leaf* be kept constantly wet, that leaf will absorb moisture, and supply another leaf below it upon the branch, even though all communication between them through the *bark* be intersected; and if a similar absorption takes places in the straws of wheat or the stems of other plants, and a retrograde motion of the fluids be produced. I conceive that the ascent of the true sap, or organizable matter, into the seed vessels, must be retarded, and that it may become the food of the parasitical plants, which then only may grow luxuriant and injurious.

“ This view of the subject, whether true or false, led me to the following method of cultivating the pea, late in au-

tumn, by which my table has been as abundantly supplied during the months of September and October as in June or July, and my plants have been as nearly free from *mildew*.

[To enable those who have not attempted to cultivate late pease to understand Mr. Knight, we would remark, that both in Europe and America, the pea sowed for an autumnal crop is generally, we might say, almost universally subject to mildew, so that we cannot enjoy this delicious green vegetable, for more than two months in the year.]

“The ground is dug in the usual way, and the spaces which will be occupied by the future rows are well soaked with water; the mould upon each side is then collected so as to form ridges seven or eight inches above the previous level of the ground, and then are well watered. After which, the seeds are sowed in single rows along the tops of the ridges. The plants very soon appear above the surface, and grow with much vigour owing to the great depth of the soil and abundant moisture. Water is given rather profusely once a week, or nine days, even if the weather proves showery. Under this mode of management the plants will remain perfectly green and luxuriant till the young blossoms and the seed vessels are destroyed by frost, and their produce will retain its proper flavour which is always taken away by mildew. The pea which I have planted for autumnal crops is a very large kind, of which the seeds are much shrivelled, and which grows very high. It is now very common in the shops of London, and my name has been, I believe, generally attached to it. [It is well known by us by the same name, and is an excellent late variety.] I prefer this variety, because it is more sweet than any other, and retains its flavour better late in autumn. It is my custom to sow some of it every ten days, and I rarely ever fail of having my table supplied till the end of October.

“The mildew of the peach and other fruit trees probably originates in the same causes as the mildew of the pea, and may be prevented by similar means. When the roots which penetrate most deeply into the soil, and are consequently best adapted to supply the tree in summer with moisture, are destroyed by a noxious subsoil, or by excess of moisture during winter, I have observed the mildew upon many varieties of the peach to become a very formidable enemy. Where, on the contrary, a deep and fertile loam permits the roots to extend to their proper depth; and where the situation is not low as to be much infested with fogs, I have found little of this disease; and in a forcing house (for prematurely ripening fruit) I have found it equally easy by appropriate management to *introduce* or *prevent* the appearance of it. When I have kept the mould very dry, and the air in the house damp and unchanged, the plants have soon become mildewed; but when the mould has been regularly, and rather abundantly watered, not a vestige of the disease has appeared.

“It must be confessed, that it is not easy to account, at first view, for the appearance of this disease under some of the preceding and various other circumstances, if it be produced by a parasitical plant which propagates by seeds, but all we ever see of mildew is simply its fructification. The plant itself, if it be one, is wholly concealed from our senses: it may consequently be transferred from one plant to another by the graft or bud, and never become visible, till the health of the tree be effected by other causes.

“I could state some cases which are very favourable to this opinion, for this disease appears readily to be communicated by a graft to another tree, when that grows in the same soil, and in similar external circumstances.

“The different species of minute insects, which feed upon the bodies of our domestic cattle are scarcely ever seen, and are never injurious so long as the larger animals retain their health and vigour; but when these become reduced by fa-

mine, or disease, the insects multiply with enormous rapidity, and though at first, they are only symptomatic of disease, they are ultimately become the chief and primary cause of its continuance. The reciprocal operation of the larger plant (on which the mildew feeds) and the mildew upon each other may possibly be somewhat similar.

“ I offer the preceding opinions merely as conjectures ; the hypothesis I have chosen has led me to the successful treatment of the disease in particular cases ; and it may in the same way lead to others, and I therefore venture to submit it to the Horticultural Society *without being very confident of its truth*. If however the countless millions of apparently organized bodies, which are generated by the different species of fungus, *be not seeds*, nature appears to wander widely from its ordinary path ; for amidst all its boundless profusion and exuberance, it does not ever, in other cases, appear to labour wholly in vain.”

So far Mr. Knight instructs, or at least attempts to instruct us. No person can read his remarks without admiring his philosophical caution and modesty, and yet it is obvious, that he concurs with his predecessor, Sir Joseph Banks, in considering mildew as a plant—an organized being endued with vegetable life. How far the admitted discovery of this fact may eventually lead to the extinction, or at least the diminution of this vegetable scourge, time only can decide, but we cannot think our readers will believe their time ill spent in perusing these ingenious suggestions.

THE CAROLINA POTATO, OR SWEET POTATO.

THIS plant is not a potato, though there is a vulgar opinion, that the common potato transplanted to southern regions

becomes sweet, and that the sweet potato on being carried to northern climes degenerates into the common potato. The common potato is what the botanists have named a *Solanum*. It is not a running plant. Its native country is probably the high lands of South America—a cold region. It delights in cold seasons, and a moist soil, and it is a fact, that it is drier and more mealy, when raised in such soils, than in dry ones. The best potatoes known are raised in the wet, flat and almost overflowed grounds of Lancashire in England; and in Ireland, so famous for its moisture and verdure, as to have received the appellation of the Emerald Isle. It flourishes admirably in the fogs of Nova Scotia and the lower parts of the state of Maine. The sweet potato has no title to be called the Carolina potato. It is an exotic, or foreign plant with them. It is a native of tropical regions; has been gradually introduced northerly, like the Lima or Saba, commonly pronounced, Civet bean. The sweet potato is not a *solanum*, but a *convolvulus*; has all the habits of the tribe of the *convolvulus*; it is a running or creeping plant. It never flowers in our country. It is very hardy—is capable of bearing more frost than the common potatoe, but in wet seasons it is watery and less sweet. It may prove my great zeal, and somewhat theoretical turn, to recommend *again* the culture of this vegetable in Massachusetts, but four years experience gives me some right to speak of it *practically*.

I recommend its culture on the following grounds.

First. It will grow and succeed here under ordinary culture.

Secondly. It is very prolific, making as good returns as the common potato.

Thirdly. It is preferred by man, bearing usually a price three times as great with us as the common potato.

Fourthly. It is preferred by all animals of whatever description. Cows and pigs eat it greedily, and even dung-hill fowls will attack and consume it in a raw state.

It will produce about 300 bushels to the acre. I have never failed to raise it with success. The only impediment to its culture is the difficulty of preserving the small tubes or roots; but as soon as it is known that there will be a demand for them, our market will be regularly supplied from New Jersey, where it has been long naturalized. It can be as easily raised, as cabbages. This I undertake to affirm.

J. LOWELL.

I would not be supposed to recommend this article except for the culture of the southern and eastern parts of the State, nor even there, except as a cheap luxury.

NOVA SCOTIA PROVINCIAL AGRICULTURAL SOCIETY.

WE received a pamphlet from John Young, Esq. Secretary of the abovenamed Society, which contains much interesting matter; but from some accident, it reached us so late as not to afford time to make such extracts from it, and to take such notice of it, as we should have been disposed to do. Perhaps there is no district of Europe or America in which a more fervent and zealous spirit in favour of an improved course of agriculture has been awakened, than in Nova Scotia. If we were to attribute this, in a very considerable degree, to the industry, zeal and talents of Mr. Young, we should be borne out, in the opinion, by the general testimony of the inhabitants of that province. The New England Agricultural Journal, a publication of great merit, has made copious extracts from this pamphlet, which renders our unavoidable omission less important. We cannot however omit the introduction of a very singular historical fact stated by the Attorney General of that Province in a very animated speech made at a meeting of the Provincial Agri-

cultural Society. One object of the speaker was to recommend the culture of grain, in preference to raising cattle.

“There cannot be a greater folly (for reasons previously assigned, said the Attorney General,) than rearing so many cattle and neglecting the plough. This has not *always* been the case in Nova Scotia; for he had been lately turning his attention to the ancient records of the Province as preserved in the public offices; with a view to collect any facts illustrative of our agriculture. When the English took possession of this country, there might be 40,000 souls in it, and the *plough* was the support of this population. He found that an embargo was imposed to *prevent the exportation of wheat and pease to the neighbouring state of Massachusetts. Although this may appear strange to some, who have been crying both long and loudly, that we could not raise our own bread,* he could assure them it was a *positive fact.* What was the consequence of this embargo, thus laid on the agricultural produce of Nova Scotia? Why, the *State of Massachusetts takes the alarm, and sets forth a strong remonstrance and complaint, that their supplies were cut off.* On this, his Majesty’s council, taking their case into consideration, and willing to give them *all the relief* in their power, grants them a licence of three months for the exportation of wheat and pease. This plain fact, which occurred in 1752, is sufficient evidence to put down all sort of opposition, and shut the mouths of those croakers who have annoyed us so long.” The learned gentleman then proceeds to state by what means, the French, who were then the only settlers, were enabled to do this. We are not prepared to say what this does or does not prove, as to the capability of Nova Scotia to raise its own bread stuffs. It is undoubtedly a very strong fact. We cite it, as an *historical curiosity merely,* and it is surely a very great one.

The same learned law officer, at an adjourned meeting made another speech, principally against the culture of *Indian corn* in that Province, and we entirely concur with

him in the impolicy of attempting it. It is a precarious crop in some seasons in some parts of the state of Maine; but the learned speaker was entirely misinformed as to the practice of the United States, when he said—"Corn, (meaning Indian corn) was very fashionable in America; (meaning the United States) because their sterile and burnt uplands were fit for nothing else." Now it is precisely our sterile and burnt uplands upon which judicious farmers *never attempt* to raise Indian corn. To that invaluable plant we generally devote our richest and best soils. On our sterile and burnt uplands we raise rye, and barley occasionally, but never Indian corn unless a man has no other lands on which he can raise it.

The learned gentleman stated another fact which the experience of New England farmers certainly does not support. "Take quantities," he says, "of Indian meal, and of oats, and mix them with water in separate troughs, and you would find that all the pigs would run to the oatmeal and eat it up entirely before they would touch the other." The inferior animals, as well as man, are creatures of habit, and it is possible that the Spanish swine who are fed on acorns and beech-nuts from infancy, would reject Indian corn if thrown down to them, though we doubt it, because instinct is very strong and very correct, and we believe that an English race-horse brought up on oats, would not disdain a manger of Indian corn, but this fact may be relied upon, that *we*, who feed our various domestic animals on every variety of grain, always find them prefer the Indian corn, and fatten best upon it. We had indeed thought, that Baron Humboldt's opinion in favour of Indian corn, supported by that of Arthur Young, had set that question at rest. Countries which are so favoured with heat, and a dry atmosphere, as to be adapted to the culture of Indian corn, can never be persuaded that any other grain is preferable. For Scotland and Nova Scotia, undoubtedly any farinaceous vegetable is better than Indian corn. We should not of course think it necessary to make

any remarks on the suggestion that oatmeal was a *heartier* food for *man* than Indian meal, or the reasons assigned by the Attorney General that "the former was more nutritious, that labourers fed on Indian bread require five or six diets per day, while a sturdy, resolute Scotchman at *any sort of work* would outdo *forty* of them."

Allowing for the natural hyperbolical expressions of a man who is warmed with his subject, we may be permitted to remark, that a Massachusetts farmer, whose bread consists principally of Indian meal, would at mowing, ploughing, hoeing, or any other agricultural labour, except digging peat, compete single handed with any labourer, whom either the highlands, or lowlands of Scotland ever produced. We do not say this in a spirit of rivalry, or with any feelings that are not entirely kind, but merely for the love of correctness. Agriculture, like all other arts and sciences can only be promoted, by precise statements of *facts*. And while necessity, the state of climate and seasons render oatmeal the unavoidable food, and the most economical food in Nova Scotia, as the Iceland moss is in that country, and fish in Lapland, there can be no use in denying the nutritious quality of Indian corn in countries, which are so favoured as to be capable of producing it. *Editors.*

AGRICULTURAL INTELLIGENCE.

JAMES OMBROSI, Esq. consul of the United States at Florence, has sent to the Massachusetts Agricultural Society, through William Little, Esq. of Boston, a few pounds of a grass seed, which he calls *Erba Medica*, and which he says is cut in Tuscany five or six times a year, and is there considered particularly nutritious food for cows or horses. It is chopped up, or in some other way, mixed with hay for cattle. Mr. Ombrosi and Mr. Little will be pleased to

accept the thanks of the society for their attention. The seed appears to us to be that of some species of *Trifolium*, evidently not the broad leaved clover of Flanders, which is on the whole considered the best by European cultivators.

The Flanders clover, however, in our seed stores, is sadly mixed with other *varieties*, and sometimes other *species* of clover. The seeds of the *Trifolium officinale*, or melilot, or yellow Trefoil, are intermixed to so great an extent, that some fields which we have sown with red clover seed, *bought as such in the shops*, are now of a yellow colour from the prevalence of the melilot. The worst of it is, that it is an increasing evil. Ten years since the melilot, or yellow clover, was so uncommon, that we examined it as a botanical novelty.

THE Caledonian Horticultural Society in 1817, sent a deputation into the Low Countries and France to ascertain what improvements had been made in Horticulture or Gardening, during the twenty years in which intercourse had been cut off between Scotland and the Continent by that scourge and disgrace of human nature, war. It was a most praiseworthy example, and the reports of that committee have been published this year, 1823, in an octavo volume full of interesting matter in relation to Gardening, to fruits, and orchards. We shall only have time and room for the insertion of some short articles.

At Bruges in Flanders, proverbially the seat of the most improved agriculture, the committee on the 12th of August, make the following remarks: "In the course of our evening walk, we were attracted by a novel appearance in husbandry, the labours of the seed time and harvest seeming here to be united and contemporaneous. We entered a fine field of luxuriant rye, part of which remained uncut, but a large proportion had been cut down this morning (August 12th.)

The crop had been carried aside ; well rotted dung had been pretty liberally laid on the stubble ; the Flemish plough was now at work ; and to complete this picture of industry, and expedition, a man was actually engaged in sowing turnips on the same portions of the ploughed fields from which the rye crop had been reaped in the morning." This example ought not to be lost upon us. Our sun is much more powerful, and our vegetation more rapid than in Flanders. We know that some farmers do raise their second crops with us ; but may we not carry this system much farther ? We certainly can do it, by limiting the extent of our cultivated grounds, and bestowing greater labour on the quantity we do cultivate.

PROFESSOR VAN MONS OF BRUSSELS.

THE Caledonian committee above mentioned, visited the nurseries of this active and intelligent horticulturist. He is Professor of Chemistry at Louvain, but has turned his attention very extensively to the improvement of fruits, principally on the plan of Mr. Knight, by raising new varieties. Of new varieties of seedling pears, raised chiefly by himself, and Monsieur Duquesne, of Mons, he considers that his collection contains about 800 ; being asked by the committee whether he meant that they were all good, he replied, that there were *that* number worthy of preservation. We must, however, put down a considerable portion of these as favourites from paternal regard, for we do not find that the London Horticultural Society to whom he has sent his best samples have as yet admitted more than half a dozen into the catalogue of good fruits. Still his zeal is worthy of great praise. Our old fruits are running out, they are subject to constantly increasing diseases. They must have been all *first* obtained by seedlings, and when a good variety was thus procured, it

was propagated by grafts. Thus it has been with our Seckle pear, the only known excellent pear ever produced in the United States. It is now in every good garden. But the present age is not content with raising one good sort in a century. It is the fashion to try the powers of nature, and the next generation will see not only a greater variety, but probably enjoy much better kinds than any age which has gone before them.

THE sweet potatoe (*Convolvulus Batatas*) has been of late introduced into culture at Paris, and sent to that market for sale, and has been strongly recommended by Mons. Leheur in a memoir on that subject. Neither the soil, nor climate of Paris is half as well calculated for this plant, as those of the vicinity of Boston. All the counties of the Old Colony, part of Middlesex, and some of the warm spots in Hampshire are excellently adapted to it. In Worcester and Berkshire it would probably not succeed, except in some favoured spots; but if the horticulturists of Paris have waited 200 years since they were introduced into Spain, it is not surprising that we have so recently brought them into experiment.

A PHENOMENON IN GRAFTING.

AT Brussels, the Committee of the Caledonian Horticultural Society witnessed one of the most extraordinary experiments in grafting; that, of inserting *an entire tree*, on the stump of another. A neighbour, having in the spring season cut down an apple tree, about fifteen feet high, which professor Van Mons considered a desirable kind, and a good healthy tree, he immediately selected a stock of *similar di-*

mensions, and cutting it off near the ground, placed on it by the mode of *peg* grafting, the foster tree ; supported the tree by stakes ; and excluded the air from the place of junction, by plastering it with clay, and afterwards heaping earth round it. The experiment succeeded perfectly ; the tree becoming in the course of the *second* season nearly as vigorous as ever.

Now though we would not recommend this experiment, because it must be very precarious, and seldom useful, yet as being one of the highest triumphs of the horticultural art, we thought it worthy of a place in this Journal. The first thought of transferring from one tree to another a different species of fruit by a naked wooden stem, was undoubtedly bold and happy ; but an attempt to transfer a *whole* tree in this manner, is certainly original.

By *peg* grafting, it must be understood, that mode of grafting which can only be practiced on trees of *exactly* the same circumference, the barks of which respectively will come into perfect contract. A hole is made in the stock, of an inch or more in depth, and the inserted tree or scion, is pared away so as to fit exactly the hole so made. The surfaces of the bark of each are then cut off smoothly, so as that the bark of the inserted tree will fit exactly all round with that of the stock. It is indispensable, that the liber and alburnum, that is the inner bark and the white wood of each tree, should exactly meet. The experiment was more curious than useful, but as a fact in natural history, it is deserving of notice. Few men would probably succeed in the attempt, but that it *can* be done in *any* case, almost staggers our faith ; yet the authority is very respectable.—ED.

RECEIPT FOR DESTROYING CATERPILLARS, USED BY THE SOCIETY OF CHRISTIANS CALLED SHAKERS, AT CANTERBURY, N. H.

“ TAKE equal parts of spirits of turpentine, and train oil ; apply them by means of a swab fixed on a pole, commence

the operation in the spring, (we suppose on the first appearance of nests) when these devouring insects begin to appear, and repeat the operation once a week, till the trees are in blow, and very few will escape with their lives."

Signed F. W. the head of the Family.

We must express our admiration of this receipt, not because of its novelty, for either of the ingredients would be quite sufficient to kill the insects, as will common soap suds from every Monday's wash *most thoroughly*, without train oil or spirits of turpentine; but we admire it, as a specimen of the practice and industry of these citizens. If our farmers would only follow *that part* of the receipt, which requires a *weekly attention*, for three successive weeks, it is immaterial whether they use spirits of turpentine or train oil, or soap suds, or the brush, proposed by Col. Pickering, the evil would be cured at *any* rate. The great difficulty is the neglect to do *any thing*, till after the Caterpillars have covered the trees with nests. Then the labours of the sluggard commence, and *one* tree, (let his receipt be ever so perfect and powerful) will cost as much time and labour as ten trees would have required three weeks sooner. If our farmers would only adopt *that portion* of the receipt, which requires a *weekly attack* on this enemy, the evil would soon cease, and in ten years we should scarce see a caterpillar in the country. By this course conditionally pursued, we have so much reduced the labour, that we have not one fourth part of the number we had three years ago.—[ED.]

ON THE CULTIVATION OF THE POPPY FOR THE PURPOSE OF PRODUCING OPIUM.

WE shall, on this topic, introduce an extract from a new Massachusetts Scientific Journal, entitled "The Boston Journal of Philosophy and the Arts." Not in any degree interfer

ing with that of Professor Silliman, the Journal in question is intended to introduce to the American public, those articles in foreign publications devoted to Philosophy and the Arts, which may be thought most useful. We meet this stranger with the most hearty, and cordial welcome. Every one who reads much, knows that it is impossible in the present state of our country, that the European scientific journals can all of them, or indeed any of them be republished here. They cannot be imported without enormous expense, owing to the inexplicable policy of laying heavy duties on all works, without discriminating those which must have a limited circulation, from those which are read by the great mass. This work is intended to give us a selection from the European publications of those articles which are peculiarly interesting to us, and adapted to our condition and progress. The Journal is under the management of Dr. J. W. Webster, Dr. John Ware, and Mr. Daniel Treadwell, and we cannot have a better pledge of sound discretion which will be exercised in the selections, than the well merited reputation of its joint editors. We most earnestly hope that it will receive that encouragement, which the very attempt deserves, and which is due to the spirited efforts of these scholars, and without which, no scientific exertions can be long successful.

We now shall introduce the notice as to the raising of the Poppy in the cold, ungenial climate of England.

“Messrs. Cowley and Staines of Winslow, Buckinghamshire, have cultivated poppies for opium, with such success, as to induce the belief, that this branch of agriculture is of *national importance*, and worthy of support. In the year 1821 they procured 60 lbs. of solid opium, *equal to the best Turkey opium*, (quere ?) from rather less than four acres and an half of ground. The seed was sown in February, came up in March, and after proper hoeing, setting out, &c., the opium gathering commenced at the latter end of July. The criterion for gathering the opium was, when the poppies hav-

ing lost their petals were covered with a bluish white mould. [With great deference, we should say, that the directions would have been more clear, if they had stated the size of the capsules or seed vessels when the gathering began.] They are then scarified, [or scratched with a pin or knife, ED.] and the head left till the juice is coagulated, about two hours, when it is removed, and new incisions made. Opium is produced until the third and fourth incisions, and in some instances till the tenth. Ninety-seven pounds were procured at an expense of (one hundred and forty-five dollars) and this being dried in the sun, yielded above sixty pounds of opium. The heads of the poppies were then allowed to dry, and were thrashed, and the seeds, it was expected, as they weighed thirteen hundred pounds, would produce seventy-one gallons of oil. The oil cake was given to cattle and pigs, with great advantage."

REMARKS.

If the cultivation of the Poppy for opium can be considered as an object of national importance in Great Britain, it seems to be certain that it must be so here. Our climate is much better adapted to this plant. Sown in May, its capsules are fit to use in July. They are larger and finer than in England. The variety from which the Turkey opium is obtained is the large single white poppy. The capsules are of the size of a large pigeon's egg. When they have obtained their greatest size, the capsule is to be slit with a pin, or sharp penknife; from the wound issues a milky kind of juice which in two hours thickens, and should then be collected and afterwards dried in the sun. In raising it on a great scale, the poppies should be sown in rows or beds, so as to permit the collectors of the opium to pass between them.

We have no expectation that such extensive experiments will be made in our country, but many curious persons may be disposed to raise a quarter of an acre each. The remarks which have been made are the result of personal observation by

J. L.—*one of the Editors.*

CATTLE SHOW, EXHIBITION OF MANUFACTURES, PLOUGHING MATCH, AND PUBLIC SALE OF ANIMALS AND MANUFACTURES, AT BRIGHTON, MASSACHUSETTS, ON WEDNESDAY AND THURSDAY, THE 15th AND 16th OF OCTOBER, 1823. TO COMMENCE AT NINE O'CLOCK A.M. ON EACH DAY.

THE Trustees of the Massachusetts Society for the Promotion of Agriculture, encouraged by the patronage of the Legislature of this State, intend to offer in Premiums, not only the sum granted by the Government for that purpose, but also the whole amount of the income of their own funds. They, therefore, announce to the public, their wish to have a Cattle Show, and Exhibition of Manufactures, &c. &c. at *Brighton*, on *Wednesday* and *Thursday*, the 15th and 16th of *October*, 1823; and they offer the following Premiums:

FOR STOCK.

For the Best Bull, raised in Massachusetts, above one year old	- - - - -	\$30
For the next best do. do.	- - - - -	20
For the next best do. do.	- - - - -	10
For the best Bull Calf, from 5 to 12 months old	- - - - -	15
For the next best do. do.	- - - - -	10
For the next best do. do.	- - - - -	5
For the best Cow, not less than three years old	- - - - -	30
For the next best do. do.	- - - - -	20
For the next best do. do.	- - - - -	15
For the best Heifer, from one to three years old, with or without calf	- - - - -	15
For the next best do. do.	- - - - -	10
For the next best do. do.	- - - - -	7
For the best Ox, fitted for slaughter, regard to be had to the mode and expense of fattening	- - - - -	30
For the next best do. do.	- - - - -	25
For the next best do. do.	- - - - -	15
For the best pair of Working Oxen	- - - - -	30
For the next best do. do.	- - - - -	25
For the next best do. do.	- - - - -	20
For the next best do. do.	- - - - -	15

For the next best do. do. - - - \$10

For the best pair of Spayed Heifers, not less than one year old - - - 25

For the best Spayed Sows, not less than four in number, and not less than five months old - - 20

The claimant to be entitled to either of these two last premiums, must state, in writing, the mode of operation and treatment, in a manner satisfactory to the Trustees.

For the best Merino Wethers, not less than six in number, having respect to form and fleece - 15

For the next best do. do. do. - - - 8

For the best Native Wethers, not less than six in number do. - - - 10

For the next best do. do. do. - - - 5

For the best Merino Ram, do. - - - 15

For the next best do. - - - 10

For the best Merino Ewes, not less than five in number, do. - - - 20

For the next best do. do. do. - - - 10

For the best Boar, not exceeding two years old - 12

For the next best do. do. - - - 8

For the next best do. do. - - - 5

For the best Sow - - - 12

For the next best do. - - - 8

For the next best do. - - - 5

For the best Pigs, not less than two in number, nor less than four months old, nor more than eight 10

For the next best do. do. - - - 5

None of the above animals will be entitled to premiums, unless they are *wholly bred* in the State of Massachusetts.

For the best Ram which shall be imported into this State, after this advertisement, and before the 15th of October next, of the improved Leicester breed of long woolled sheep - - - 75

or a gold medal of that value, at the option of the importer.

For the next best do. do.	50
For the best Ewe, of the same breed, imported under the same terms, and for the like superior qualities	60
For the next best do. do.	40
To the person who shall import into this State, from Europe, a male and female Goat, of the pure Cashmere breed	100

The persons claiming these premiums to engage to keep the imported animals within the State.

No animal, for which to any owner one premium shall have been awarded, shall be considered a subject for any future premium of the Society, except it be for an entirely distinct premium, and for qualities different from those for which the former premium was awarded.

Any of the above Stock, when raised and still owned at the time of the exhibition, by the person who raised them, will entitle the claimant to an allowance of ten per cent. in addition. But Sheep, to be entitled to any of the above premiums, must be raised by the person entering them.

FOR AGRICULTURAL EXPERIMENTS.

To the person who shall raise the greatest quantity of Indian Corn on an acre, not less than seventy bushels	\$30
To the person who shall make the most satisfactory experiment, to ascertain the best mode of raising Indian Corn, whether in hills or rows, not less than half an acre being employed in each mode, in the same field, the quantity and quality both of land and manure to be equal and uniform in each mode; all to receive a cultivation requisite to produce a good crop	20
To the person who shall raise the greatest quantity of Vegetables, grain, peas and beans excepted, for winter consumption, of the stock of his own farm, and not for sale, in proportion to the size of the farm and stock kept, having regard to the respective value of said vegetables as food, stating the expense of raising	

the same, and the best mode of preserving the same through the winter	30
To the person who shall raise the greatest quantity of winter Wheat on an acre	20
To the person who shall raise the greatest quantity of spring Wheat on an acre	20
To the person who shall raise the greatest quantity of Barley on an acre, not less than forty-five bushels	20
To the person who shall raise the greatest crop of Millet on an acre, cut and cured for hay, the claimant giving evidence of the time of sowing, the quantity of seed sown, and the quantity of hay produced	20
To the person who shall raise the greatest quantity of Carrots on an acre, not less than six hundred bushels	20
To the person who shall raise the greatest quantity of Potatoes on an acre, not less than five hundred bushels,	20
To the person who shall raise the greatest quantity of common Beets on an acre, not less than six hundred bushels,	20
To the person who shall raise the greatest quantity of Parsnips on an acre, not less than four hundred bushels,	20
To the person who shall raise the greatest quantity of Mangel Wurtzel on an acre, not less than six hundred bushels,	20
To the person who shall raise the greatest quantity of Ruta Baga on an acre, not less than six hundred bushels,	20
To the person who shall raise the greatest quantity of Turnips on an acre, not less than six hundred bushels,	20
To the person who shall raise the greatest quantity of common Turnips, after any other crop in the same season, being not less than four hundred and fifty bushels,	20
To the person who shall raise the greatest quantity of common turnips, after any other crop in the same sea-	

son, being not less than four hundred and fifty bushels, - - - - -	20
To the person who shall raise the greatest quantity of Onions on an acre, not less than six hundred bushels, - - - - -	20
To the person who shall raise the greatest quantity of Cabbages on an acre, not less than 25 tons weight, free from earth when weighed, - - - - -	20
To the person who shall give satisfactory evidence on 'Soiling Cattle,' not less than six in number, and through the whole season, together with a particular account of the food given, and how cultivated, -	30
To the person who shall make the experiment of turning in green crops as a manure, on a tract not less than one acre, and prove its utility and cheapness, giving a particular account of the process and its result - - - - -	30
To the person who shall, by actual experiment, prove the best season and modes of laying down lands to grass, whether spring, summer or fall seeding be preferable, and with or without grain on different soils - - - - -	30
To the person who shall raise the greatest quantity of dry Peas on an acre, not less than thirty bushels, -	20
To the person who shall raise the greatest quantity of dry Beans on an acre, not less than thirty bushels, -	20
To the person who shall give proof of having produced the largest quantity of dressed Flax, raised on half an acre, not less than two hundred and fifty pounds - - - - -	20
To the person who shall take up in the season, on his own farm, the greatest quantity of good Honey, and shall at the same time exhibit superior skill in the management of Bees, - - - - -	10
For the best Cheese, <i>not less</i> than one year old, and not less in quantity than one hundred pounds, -	10
For the next best do. do. - . . . -	5

For the best Cheese <i>less</i> than one year old,	-	-	10
For the next best do. do.	-	-	5
To the person who shall prove to the satisfaction of the Trustees, that his mode of rearing, feeding and fattening neat cattle is best,	-	-	20
For the next best Butter, not less than fifty pounds,			15
For the next best do. do.	-	-	10
For the next best do. do.	-	-	7
For the next best do. do.	-	-	5
For the greatest quantity of Butter and Cheese, made between the 15th of May, and the 1st of October, from not less than four Cows, the quality of the Butter and Cheese, and the number of Cows to be taken into consideration, and specimens to be exhibited at the Show, of not less than twenty pounds of each, and the mode of feeding, if any thing besides pasture was used,	-	-	20
To the person who shall prove by satisfactory experiments, to the satisfaction of the Trustees, the utility and comparative value of the cobs of Indian Corn, when used with or without the grain itself, ground or broken,	-	-	20
For the best specimen of Cider, not less than one barrel, made in 1822, manufactured by the person who shall exhibit the same, and from apples grown on his own farm	-	-	20
For the second best barrel,	-	-	15
[These premiums will be continued in future years. Persons claiming them must state, in writing, their process of making and managing their Cider, and the kind of apples used.]			
For the best specimen of Currant Wine, not less than one gallon, exhibited by any person who shall have made not less than 30 gallons in the same season in which that which shall be exhibited was made, (a statement to be given, in writing, of the process of making the same,)	-	-	10

For the next best do. do. - - - - - 5

To entitle himself to either of the Premiums for Grain or Vegetable crops, the person claiming, must cultivate a tract of at least one acre in one piece, with the plant or production for which he claims a premium, and must state, in writing, under oath of the owner, and of one other person, (accompanied by a certificate of the measurement of the land by some sworn surveyor,) the following particulars :

1. The state and quality of the spring of 1823.
2. The product and general state of cultivation and quantity of manure employed on it the year preceding.
3. The quantity of manure used the present season.
4. The quantity of seed used, and if Potatoes, the sort.
5. The time and manner of sowing, weeding, and harvesting the crop, and the amount of product, ascertained by actual measurement, after the whole produce for which a premium is claimed, is harvested, and the entire expense of cultivation.

And in relation to all vegetables, except Potatoes, Onions, and common Turnips, the fair average weight of at least twenty bushels must be attested ; and if there be hay scales in the town in which raised, not less than three average cart loads must be weighed.

The claim under this head, together with the evidences of the actual product, must be delivered, free of expense, to Benjamin Guild, Esq. in Boston, Assistant Recording Secretary of this Society, on or before the first day of December next—the Trustees not intending to decide upon claims under the head of Agricultural Experiments, until their meeting in December.

FOR INVENTIONS.

To the person who shall use the Drill Plough, or Machine, and apply it most successfully to the cultivation of any small Grains or Seeds, on a scale not less than one acre, - - - - - \$20

To the person who shall invent the best machine for pulverizing and grinding Plaster to the fineness of

twenty-five bushels per ton, and which shall require no more power than a pair of oxen or horse, to turn out two tons per day, and so portable that it can be removed from one farm to another without inconvenience, - - - - - 30

To the person who shall produce, at the Show, any other Agricultural Implement, of his own invention, which shall, in the opinion of the trustees, deserve a reward, a premium not exceeding twenty dollars, according to the value of the article exhibited, - - - - - 20

In all cases proofs must be given of the work done by the Machine, before it is exhibited ; and of its having been used and approved by some practical farmer. Persons who have taken out Patents for their inventions, are not thereby excluded from claiming any of the above premiums.

FOR FOREST TREES.

For the best plantation of White Oak Trees, not less than one acre, nor fewer than one thousand trees per acre, to be raised from the acorn, and which trees shall be in the best thriving state, on the first of September, 1823, - - - - - \$100

For the best plantations of White Ash, and of Larch Trees, each of not less than one acre, nor fewer than one thousand trees per acre, to be raised from the seeds, and which trees shall be in the best thriving state, on the first of September, 1823, - - - - - 50

For the best Live Hedge made of either the White or Cockspur Thorn, planted in 1820, not less than one hundred rods, and which shall be in the best state in 1823, - - - - - 50

To the person who shall have planted out on his farm, since the spring of 1815, the greatest number of Apple Trees, not less than one hundred in number, and who shall exhibit to the trustees, at the Show in 1827, satisfactory evidence of his having managed them with care and skill, - - - - - 50

FOR DOMESTIC MANUFACTURES.

To the person or corporation who shall produce the best specimen of fine Broadcloth, not less than 1 5-8 yards wide, exclusive of the list, forty yards in quantity, and dyed in the wool,	-	-	-	-	\$20
For the second best do. do. do.	-	-	-	-	15
For the best superfine Cassimere, not less than 3-4 yard wide, nor less than forty yards in quantity,					12
For the second best do. do. do.	-	-	-	-	8
For the best superfine Sattinet, 3-4 yard wide, not less than 50 yards	-	-	-	-	8
For the second best do. do. do.	-	-	-	-	5
For the best Sole Leather, not less than five sides,					10
For the second best do. do.	-	-	-	-	5
For the best dressed Calve Skins, not less than twelve in number	-	-	-	-	10
For the second best do. do.	-	-	-	-	5

FOR HOUSEHOLD MANUFACTURES.

For the best Woollen Cloth, 3-4 yard wide, not less than twenty yards in quantity,	-	-	-	-	\$12
For the second best do. do.	-	-	-	-	8
For the best double milled Kersey, 3-4 yard wide, not less than twenty yards in quantity,	-	-	-	-	12
For the second best do. do.	-	-	-	-	8
For the best Coating, 3-4 yard wide, not less than 20 yards in quantity,	-	-	-	-	8
For the second best do. do.	-	-	-	-	6
For the best Flannel, 7-8 yard wide, not less than 45 yards in quantity,	-	-	-	-	10
For the second best do. do.	-	-	-	-	7
For the best yard wide Carpeting, not less than 30 yards in quantity,	-	-	-	-	15
For the second best do. do.	-	-	-	-	7
For the best 5-8 yard wide Stair Carpeting, not less than 30 yards in quantity,	-	-	-	-	10
For the second best do. do.	-	-	-	-	7

For the best pair of Blankets, not less than 8-4 wide and 10-4 long, - - - - -	6
For the second best do. do. - - - - -	4
For the best Woollen Knit Hose, not less than 12 pair in number, - - - - -	5
For the second best do. do. - - - - -	3
For the best Worsted Hose, not less than 12 pair in num- ber, - - - - -	5
For the second best do. do. - - - - -	3
For the best Men's Half Hose, (woollen) not less than 12 pair in number, - - - - -	4
For the second best do. do. - - - - -	2
For the best Men's Woollen Gloves, not less than 12 pair in number, - - - - -	5
For the second best do. do. - - - - -	3
For the best Linen Diaper, 5-8 yard wide, not less than 30 yards in quantity, - - - - -	5
For the second best do. do. - - - - -	3
For the best yard wide Diaper, (for table linen) not less than 30 yards in quantity, - - - - -	10
For the second best do. do. - - - - -	5
For the best specimen of Sewing Silk, raised and spun in this State, of good fast colours, not less than one pound, - - - - -	5
For the second best do. do. - - - - -	3
For the best Linen Cloth (for shirting or sheeting) one yard wide, and twenty-five yards long, - - - - -	8
For the second best do. do. - - - - -	4
To the person who shall produce the best specimen of any Cotton fabrics in private families, not less than five pieces, - - - - -	20

All the above Manufactures, (except when of Cotton) must be of the growth and manufacture of the State of Massachusetts. And all Manufactures, when presented, must have a private mark, and any public or known mark must be completely concealed, so as not to be seen, or known by the

Committee, nor must the Proprietors be present when they are examined; in default of either of these requisitions, the articles will not be deemed entitled to consideration or premium.

Animals, Manufactures, or Articles, may be offered for premium at Brighton, notwithstanding they may have received a premium from a County Agricultural Society.

It is understood, that whenever merely from a want of competition, any of the claimants may be considered entitled to the premium, under a literal construction, yet if, in the opinion of the Judges, the object so offered is not deserving of any reward, the Judges shall have a right to reject such claims. Persons to whom premiums shall be awarded, may, at their option, have an article of Plate, with suitable inscriptions, in lieu of money. Premiums will be paid within ten days after they shall be awarded.

That in any case in which a pecuniary premium is offered, the Trustees may, having regard to the circumstances of the competitor, award either one of the Society's gold or silver medals in lieu of the pecuniary premium annexed to the several articles.

That if any competitor for any of the Society's premiums shall be discovered to have used any disingenuous measures, by which the objects of the society have been defeated, such person shall not only forfeit the premium which may have been awarded to him, but be rendered incapable of being ever after a competitor for any of the Society's premiums.

All premiums not demanded within six months after they shall have been awarded, shall be deemed as having been generously given to aid the funds of the Society.

PLOUGHING MATCH.

On the second day of the Cattle Show, viz. the 16th day of October, Premiums will be given to the owners and ploughmen of the three Ploughs, drawn by two yoke of oxen, and to the three Ploughs drawn by one yoke oxen, which shall be adjudged, by a competent Committee, to have performed the

best work with least expence of labor, not exceeding half an acre to each plough. Notice will be given in the public Papers, at least six weeks before said day, that a piece of ground has been provided for twenty ploughs—ten double and ten single teams; and that entries may be made of the names of the competitors until the morning of the 16th. Preference will be given to those who enter first; but if, on calling the list at the hour appointed, precisely, those first named do not appear, the next in order will be preferred. There will be two Committees, of three persons each—one to be the judges of the ploughing by the double teams, the other of the ploughing by the single teams—the latter to have assigned to them a part of the field distinct from that of the double teams.

Premiums as follows, (being the same for the double and single teams.)

First Plough	\$15	Second Plough	\$10	Third Plough	\$6
Ploughman	8	Ploughman	5	Ploughman	3
Driver	4	Driver	3	Driver	2

In each case, if there be no Driver, both sums to be awarded to the Ploughman.

The persons intending to contend for these Prizes, must give notice, in writing, to S. W. POMEROY, or GORHAM PARSONS, Esq's of *Brighton*. The competitors will also be considered as agreeing to follow such rules and regulations as may be adopted by the Committee on the subject. The ploughs to be ready to start at 9 o'clock, A. M.

The result of the last Ploughing Matches at *Brighton*, and the satisfaction expressed by so many of their agricultural brethren, will induce the Society to continue these premiums annually, in connexion with the Cattle Show, as an efficacious means for exciting emulation and improvement in the use and construction of the *most important instrument of agriculture*.

Persons intending to offer any species of Stock for premiums, are requested to give notice thereof, either by letter

(post paid) stating the article, or to make personal application to JONATHAN WINSHIP, at *Brighton*, on or before the 14th day of October, and requesting him to enter such notice or application, so that tickets may be ready at 9 o'clock on the 15th. No person will be considered as a competitor who shall not have given such notice, or made such application for entry, on or before the time above specified.

All articles of manufactures and inventions, must be entered and deposited in the Society's Rooms on Monday, the 13th of October, and will be examined by the Committees on Tuesday, the 14th, the day before the Cattle Show; and no person but the Trustees shall be admitted to examine them before the Show. The articles so exhibited, must be left till after the Show, for the satisfaction of the public.

The applicants will be held to a rigid compliance with this rule relative to entries, as well as to the other rules prescribed.

The examination of every species of stock, (except working oxen) will take place on the 15th; and the trial of Working Oxen, and Ploughing Match, on the 16th of October.

The Trustees also propose to appropriate, on the second day of the Cattle Show, their Pens for the public sale of any Animals, that have been offered for premium, and also of any others, that are considered by them, as possessing fine qualities; and their Halls for the public sale of Manufactures. Both sales to take place at half past eleven o'clock, precisely. And for all Animals or Manufactures, that are intended to be sold, notice must be given to the Secretary, before 10 o'clock of the 16th. Auctioncers will be provided by the Trustees.

By order of the Trustees,

R. SULLIVAN,	} Committee.
J. PRINCE,	
G. PARSONS,	
E. H. DERBY,	

January, 1823.

THE

Massachusetts Agricultural

REPOSITORY and JOURNAL.

VOLUME VII.

CONDUCTED BY THE TRUSTEES OF THE MASSACHUSETTS AGRICULTURAL
SOCIETY.

BOSTON :

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1823

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